SES COLLEGE SREEKANDAPURAM

(Accredited by NAAC with 'B' Grade) Affiliated to Kannur University

Criterion 1

Curricular Aspects

1.2 Academic Flexibility

1.2.1 Percentage of Programmes in which Choice Based Credit System (CBCS)/ elective course system has been implemented

Sl No.	**Supporting Documents**
1	Minutes of Academiccouncil/BOS meeting
2	Detailed Syllabus

KANNUR UNIVERSITY

(Abstract)

B.A English Programme- Scheme of Core & Generic Elective Courses of the Programme and Syllabus and Pattern of Question Paper of the Ist Semester of B.A English (Language and Literature) under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated Colleges with effect from **2019 Admission**- Implemented- Orders issued.

ACADEMIC BRANCH

No.Acad.C3/13219/2019 Dated: Civil Station P.O .26.06.2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
4. The Minutes of the Meeting of the Board of Studies in English (UG), held on 14.06.2019
5. Scheme and Ist Semester Syllabus of B.A English (Language and Literature) Programme, Submitted by the Chairperson, Board of Studies in English (UG), dated: 22.06.2019

ORDER

1.A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG Programmes in Affiliated Colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision Processes such as conducting the meeting of various Boards of Studies, Workshops, & discussions.

3. The Revised Regulation for UG Programmes in Affiliated Colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. As per paper read (4) above, the Board of Studies in English (UG) finalized the Scheme of Core, & Generic Elective Courses ,Syllabus and Pattern of Question Papers of B.A English (Language and Literature) Programme, to be implemented with effect from 2019 Admission.

5. Subsequently, as per paper read (5) above, the Chairperson, Board of Studies in English (UG) , submitted the finalized copy of the Scheme of Core & Generic Elective Course and Syllabus and Pattern of Question Paper of the Ist Semester of B.A English (Language and Literature) Programme, for implementation with effect from 2019 Admission.

6. The Vice Chancellor, after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, accorded sanction to implement the Scheme of Core & Generic Elective Courses and Syllabus and Pattern of Question Papers of the Ist Semester of B.A English (Language and Literature) Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated Colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme of Core & Generic Elective Courses and Syllabus and Pattern of Question Paper of the Ist Semester of B.A English (Language and Literature) Programme, are uploaded in the University Website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering B.A English Programme

Copy to:- 1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in English (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I/ARII (Academic)
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

For more details log on to www.kannuruniversity.ac.in

KANNUR UNIVERSITY

BOARD OF STUDIES IN ENGLISH (U.G.)

SYLLABUS OF CORE COURSES OF B.A ENGLISH LANGUAGE AND LITERATURE PROGRAMME
AND
GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY
VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the ManandavadyTaluk of Wayanad Revenue District.

Mission:

- To produce anddisseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

Kannur University

Programme Outcomes (PO)

PO 1.Critical Thinking:

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

Programme Specific Outcomes for BA in English Language and Literature

PSO 1.Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

KANNUR UNIVERSITY

B.A ENGLISH PROGRAMME PROGRAMME

COURSE AND CREDIT DISTRIBUTION STATEMENT

Courses	**No of Courses**		**Credit**	
English Common Course (ECC)		6		22
Additional Common Course (ACC)		4		16
Core Course	15	16	60	64
Discipline Elective Core Course (DSEC)	1		4	
Complimentary Elective Course (CEC)		4		16
Generic Elective Course (GEC)		2		2
Total		**32**		**120**

KANNUR UNIVERSITY

B.A ENGLISH PROGRAMME PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	**Course Title**	**Credits**	**Hours per week**	**Marks**		
				CE	**ESE**	**TOTAL**
I	English Common Course–I	4	5	10	40	50
	English Common Course-II	3	4	10	40	50
	Additional Common Course-I	4	4	10	40	50
	Complementary Elective Course-1	4	6	10	40	50
	Core Course-I- Malayalam Literature in English Translation	5	6	10	40	50
II	English Common Course-III	4	5	10	40	50
	English Common Course-IV	3	4	10	40	50

	Additional Common Course-II	4	4	10	40	50
	Complementary Elective Course-II	4	6	10	40	50
	Core Course-II- Academic Writing, Methodology and Research Project	5	6	10	40	50
III	English Common Course-IV	4	5	10	40	50
	Additional Common Course-III	4	5	10	40	50
	Complementary Elective Course-III	4	6	10	40	50
	Core Course III- Old English to Medieval English Literature (500-1500)	3	4	10	40	50
	Core Course-IV- Renaissance and Restoration Literatures (1485-1780)	4	5	10	40	50
IV	English Common Course VI	4	5	10	40	50
	Additional Common Course-IV	4	5	10	40	50
	Complementary Elective Course-IV	4	6	10	40	50
	Core Course-V- The Romantic Period (1780-1832)	4	5	10	40	50
	Core Course VI- The Victorian Period (1832-1901)	3	4	10	40	50
V	Core Course VII- The Early Twentieth Century ((1901-1939)	4	6	10	40	50
	Core Course VIII- The Late Twentieth and Twenty-First Centuries(1939-2018)	5	6	10	40	50
	Core Course IX- Post colonial Literatures in English	5	6	10	40	50
	Core Course X- Linguistics	4	5	10	40	50

	Core Course XI- Project	2	1	5	20	25
	Generic Elective Course	2	2	5	20	25
VI	Core Course XII - Critical Theory	5	6	10	40	50
	Core Course XIII- Women's Writing	4	5	10	40	50
	Core Course XIV- Indian Writing in English	3	4	10	40	50
	Core Course XV- Film Studies	4	5	10	40	50
	Core Course XVI- Discipline Specific Elective	4	4	10	40	50
TOTAL		**120**	**150**	**-**	**-**	**1500**

TOTAL CREDIT (Sum of total credits of all semester): 120

TOTAL MARKS (Sum of total marks of all semester): 1500

(2019 ADMISSION ONWARDS)

Core Courses in English Language and Literature
Programme Specific Outcomes for BA in English Language and Literature

PSO 1.Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

B.A. ENGLISH LANGUAGE AND LITERATURE--CORE COURSES
WORK AND CREDIT DISTRIBUTION
PART -1 (CORE COURSES)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1B01ENG	Malayalam Literature in English Translation	I	6	5	3
2B02ENG	Academic Writing, Methodology and Research Project	II	6	5	3
3B03ENG	Old English to Medieval English Literature (500-1500)	III	4	3	3
3B04ENG	Renaissance and Restoration Literatures (1485-1780)	III	5	4	3
4B05ENG	The Romantic Period (1780-1832)	IV	5	4	3
4B06ENG	The Victorian Period (1832-1901)	IV	4	3	3
5B07ENG	The Early Twentieth Century ((1901-1939)	V	6	4	3
5B08ENG	The Late Twentieth and Twenty-First Centuries(1939-2018)	V	6	5	3
5B09ENG	Postcolonial Literatures in English	V	6	5	3
5B10ENG	Linguistics	V	5	4	3
6B11ENG	Project	VI	1	2	--
6B12ENG	Critical Theory	VI	6	5	3
6B13ENG	Women’s Writing	VI	5	4	3
6B14ENG	Indian Writing in English	VI	4	3	3
6B15ENG	Film Studies	VI	5	4	3
6B16ENG	Discipline Specific Elective	VI	4	4	3
TOTAL			-	**64**	

KANNUR UNIVERSITY

(Abstract)

B.Com Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12281/2019 Dated, Civil Station P.O.,20.06.2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated.10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O.No.Acad.C2/429/2017 Vol.II dated.03-06-2019.
4. The Minutes of the Meeting of the Board of Studies in Commerce (UG) held on 07.06.2019
5. Syllabus of B.Com.Programme, submitted by the Chairperson, Board of Studies in Commerce (UG), dated 12.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2.The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed different phases of Syllabus Revision processes such as conducting the meetings of various Boards of Studies and Workshops, discussions etc.

3.The Revised Regulations for UG programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) were implemented with effect from 2019 Admission as per paper read (3) above.

P.T.O

4.As per paper read (4) above, the Board of Studies in Commerce (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Com Programme to be implemented with effect from 2019 Admission.

5.As per paper read (5) above, the Chairperson, Board of Studies in Commerce (UG) has submitted the final copy of the Scheme, Syllabus & Pattern of Question Papers of B. Com Programme for implementation with effect from 2019 Admission.

6.The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(i) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) for B.Com programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting before the Academic Council.

7.The Scheme, Syllabus & Pattern of Question Paper of B.Com.Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
for REGISTRAR

To
The Principals of Colleges offering B.Com Programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Commerce (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, COMMERCE (UG)

SYLLABUS FOR
CORE COURSES, GENERAL AWARENESS COURSES,
COMPLEMENTARY ELECTIVE COURSES
FOR B.COM DEGREE PROGRAMME
AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY
VISION AND MISSION

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

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- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO 1.Critical Thinking:

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

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3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

INTRODUCTION

The Board of Studies of Commerce (UG) as per the direction of Kannur University has decided to introduce outcome based course syllabus for the undergraduate Programme in commerce with effect from the academic year 2019-20. The process of revising and restructuring the syllabus was undertaken in compliance with the national education policy of the University Grants Commission, the directions of the Kerala State Higher Education Council and Kannur University. This revised syllabus is the result of a series of meetings of the board of studies and workshop of college teachers conducted for this purpose. Suggestions and recommendations of scholars, teachers, students and other eminent persons in the area of commerce were taken in to consideration while drafting the new syllabus. Due care has been taken to make the new curriculum up to date, pertinent for the current scenario and in tune with the industrial requirements

I express my sincere gratitude to all members of the Board of Studies of commerce (UG), all scholars and faculty members who helped to fulfill this task.

Dr. RAJESH KUMAR .E. R
CHAIRMAN
Board of Studies, Commerce (UG)

KANNUR UNIVERSITY

PROGRAMME SPECIFIC OUTCOME OF B.COM DEGREE

After the successful completion of the B.Com Degree Pragramme, the students shall be able to;

PSO 1:

Understand the concepts and techniques of commerce and its application in business environment

PSO 2:

Conceive the ideas on entrepreneurship and develop the skills for setting up and management of business organizations

PSO 3:

Develop the skills and abilities to become competent and competitive in the business world

PSO 4:

Develop the competency to take wise decisions at personal and professional level

PSO 5:

Appraise the impact of other disciplines on the working of business

INDEX

KANNUR UNIVERSITY
B.COM DEGREE PROGRAMME

COURSE AND CREDIT DISTRIBUTION STATEMENT

Courses	No of Courses		Credit	
English Common Course (ECC)		4		14
Additional Common Course (ACC)		2		8
Core Courses:				
Discipline Specific Core Course (DSCC)	13	17	48	64
Discipline Elective Core Course (DECC)	4		16	
General Awareness Course (GAC)		4		16
Complimentary Elective Course (CEC)		4		16
Generic Elective Course (GEC)		1		2
Total		**32**		**120**

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title	Type of Course	Credits	Hours per week
I	English Common Course I	ECC	4	5
	English Common Course II	ECC	3	4
	Additional Common Course I	ACC	4	5
	Management Concepts and Principles (1B01 COM)	DSCC	4	5
	Business Statistics and Basic Numerical Skills(1A11 COM)	GAC	4	6
	TOTAL		**19**	**25**
II	English Common Course III	ECC	4	5
	English Common Course IV	ECC	3	4
	Additional Common Course II	ACC	4	5
	Functional Applications of Management (2B02 COM)	DSCC	4	5
	Quantitative Techniques for Business Decisions (2C01 COM)	CEC	4	6
	TOTAL		**19**	**25**
III	Entrepreneurship development (3A12 COM)	GAC	4	5
	Advanced Accounting (3B03 COM)	DSCC	4	6
	Course I from Elective Stream I/II/III/IV (3B04 COM)	DECC	4	5
	Business Regulatory Framework (3C02 COM)	CEC	4	4
	Business Economics (3C03 COM)	CEC	4	5
	TOTAL		**20**	**25**

Semester	Course Title	Type of Course	Credits	Hours per week
IV	General Informatics Skills (T+P) (4A13 COM)	GAC	4(3+1)	5(3+2)
	Environmental Studies and Disaster Management (4A14 COM)	GAC	4	5
	Corporate Accounting (4B05 COM)	DSCC	4	6
	Course II from Elective Stream I/II/III/IV (4B06 COM)	DECC	4	5
	Corporate Law and Business Regulations (4C04 COM)	CEC	4	4
	TOTAL		**20**	**25**
V	Business Research Methodology (5B07 COM)	DSCC	3	4
	Income Tax law and Practice (5B08 COM)	DSCC	4	5
	Cost Accounting (5B09 COM)	DSCC	4	5
	Banking Principles and Operations (5B10 COM)	DSCC	4	5
	Course III from Elective Stream I/II/III/IV (5B11 COM)	DECC	4	4
	Generic Elective Course (5D-- COM)	GEC	2	2
	TOTAL		**21**	**25**
VI	Financial Markets and Services (6B12 COM)	DSCC	3	4
	Management Accounting (6B13 COM)	DSCC	4	5
	Auditing and Corporate Governance (6B14 COM)	DSCC	4	5
	Income Tax and GST (6B15 COM)	DSCC	4	5
	Course IV from Elective Stream I/II/III/IV (6B16 COM)	DECC	4	4
	Project (6B17 COM)	DSCC	2	2
	TOTAL		**21**	**25**

Industrial Visit

The forth/fifth semester students of regular colleges shall be taken under the supervision of faculty members to business or industrial units so as to enable them to have a direct knowledge about location, layout, managerial function, HR management or any area of study. The study tour to an industrial/business unit will form a part of the curriculum. The report submitted by the students in this respect shall be considered as one of the assignment of any one course in the concerned semester.

PART A:

B.COM CORE COURSES

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
1B01 COM	Management Concepts and Principles	I	5	4	3
2B02 COM	Functional Applications of Management	II	5	4	3
3B03 COM	Advanced Accounting	III	6	4	3
3B04 COM	Elective Course I	III	5	4	3
4B05 COM	Corporate Accounting	IV	6	4	3
4B06 COM	Elective Course II	IV	5	4	3
5B07 COM	Business Research Methodology	V	4	3	3
5B08 COM	Income Tax law and Practice	V	5	4	3
5B09 COM	Cost Accounting	V	5	4	3
5B10 COM	Banking Principles and Operations	V	5	4	3
5B11 COM	Elective Course III	V	4	4	3
6B12 COM	Financial Markets and Services	VI	4	3	3
6B13 COM	Management Accounting	VI	5	4	3
6B14 COM	Auditing and Corporate Governance	VI	5	4	3
6B15 COM	Income Tax and GST	VI	5	4	3
6B16 COM	Elective Course IV	VI	4	4	3
6B17 COM	Project	VI	2	2	-

ELECTIVE STREAMS

I - CO-OPERATION

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Co-operative Principles	III	5	4	3
4B06 COM	Management of Co-operatives	IV	5	4	3
5B11 COM	Co-operative laws	V	4	4	3
6B16 COM	Co-operative Accounting and Legislations	VI	4	4	3

II - COMPUTER APPLICATION

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Introduction to Computers and Networks	III	5	4	3
4B06 COM	Data Base management System	IV	5	4	3
5B11 COM	Information Technology for Business	V	4	4	3
6B16 COM	Accounting Packages - TALLY	VI	4	4	3

III - FINANCE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Financial Management	III	5	4	3
4B06 COM	Investment Management	IV	5	4	3
5B11 COM	Goods and Service Tax	V	4	4	3
6B16 COM	Corporate Tax Planning	VI	4	4	3

IV - MARKETING

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Marketing Principles	III	5	4	3
4B06 COM	Consumer Behaviour	IV	5	4	3
5B11 COM	Promotion Management	V	4	4	3
6B16 COM	Market Research	VI	4	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	4	40*
INTERNAL	1	10

* 20 marks for theory and 20 marks for practical for courses having practical

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS	REMARKS
COMPONENT 1 Test paper	3	6	Minimum two test papers and mark should be awarded on the basis of average mark obtained by the student
COMPONENT 2 Assignments/ Seminar	2	4	Department should keep a record of the work done

Internal mark for test papers should be given as per the following criteria;

Average mark obtained in the test papers	Percentage of internal mark
80% and above	100%
60% to 79%	80%
40% to 59%	60%
20 % to 39%	40%
Below 20%	20%

KANNUR UNIVERSITY

(Abstract)

B Sc Chemistry/ B.Sc.Biochemistry/B.Sc.Polymer Chemistry Programmes -Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad/C2/12380/2019 Civil Station P.O Dated 20/06/2019

Read:- 1. U.O.No.Acad.C2/429/2017 dt.10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O No.Acad.C2/429/2017 Vol.II dt.03-06-2019
4. The Minutes of the meeting of the Board of Studies in ChemistryUG held on 07-06-2019
5. The Syllabus submitted by the Chairperson, Board of Studies in Chemistry (UG)dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies, Workshops and discussions.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Chemistry (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc.Chemistry/B.Sc. Biochemistry/ B.Sc.Polymer Chemistry Programmes to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Chemistry (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc. Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry programmes.
6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc Chemistry, B.Sc Biochemistry and B.Sc Polymer Chemistry programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in Affiliated colleges with effect from 2019 Admission, subject to reporting to the Academic Council.
7. The Scheme, Syllabus & Pattern of Question Papers of B.Sc Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry Programmes are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
for REGISTRAR

To

The Principals of Colleges offering B.Sc Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Chemistry (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

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SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, CHEMISTRY (UG)

SYLLABUS FOR CHEMISTRY CORE COURSE

COMPLEMENTARYELECTIVE COURSE AND GENERIC ELECTIVE COURSES

FOR BSc CHEMISTRY PROGRAMME

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

ANNEXURE (i)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce anddisseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

ANNEXURE (ii)

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO 1.Critical Thinking:

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The syllabus is prepared based on an interdisciplinary approach and aim to provide the students a deep understanding of the basic concepts of chemical sciences by acquiring the knowledge of terms, facts, concepts, processes, techniques and principles of the subject. It attempts to equip the students to cater to the industrial needs and to utilise them in the utmost practical manner.

The updated syllabus is preparedbased on Kannur University Regulations for Choice Based Credit and Semester System for Under-Graduate Programme 2019" (in OBE – Outcome Based Education – system) (KUCBCSSUG 2019) with a view to implement outcome based education (OBE) and curriculum from the academic year 2019 -20 onwards as proposed by higher education agencies .

An OBE curriculum means, starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction and assessment to make sure this learning ultimately happens.Intended learning outcomes (POs, PSOs and COs) which specify what graduates completing BSc Chemistry programme are expected to know, understand and be able to do at the end of their programme of studywere discussed at various stages in three day OBE workshop conducted by KSHEC Trivandrum associated with Kannur University. These learning outcomes(POs,PSOs and COs) were further discussed along with content of the syllabus and assessment methods at the workshops conducted for faculty members and other stakeholders for restructuring curriculum by Kannur University and finalised after consulting with intellectuals, academicians, faculty members , researchers and students

The B Sc degree programme in Chemistry designed for students to attainthe intended learning outcomes which specified as PSOs(Programme Specific Outcome) and COs(Course Outcome)are clearly stated in the syllabus.

The mission and vision statements and PO statements of the University were givenat the beginning of the syllabus and PSO statements before the scheme of the syllabus .The CO statements are givenin the beginning of each of the courses. Teachers need to aware these statements as these describe the desired educational accomplishments of the degree programs.The reference materials have been recommended after a thorough study. The revised course pattern, distribution of credits, scheme of evaluation and syllabus approved by the board are given.

There are many personalities whose support and guidance made this restructured syllabus a reality. I express my profound gratitude to the members of the Board of Studies (UG) in Chemistry who provided me extensive personal and professional support during the work of restructuring this syllabus. With immense pleasure and gratitude I remember the untiring support rendered by the faculty members of Chemistry from various Colleges of Kannur University,academic community and all other stake holderswho worked for preparing this restructured syllabus and curriculum.

Saheed VK

Chairperson

Board of Studies, Chemistry(UG) ,Kannur University.

Kannur University

BSc Chemistry Programme

Programme Specific Outcomes (PSOs)

After successful completion of three year degree program in Chemistry a student should be able to;

PSO 1 Understand the fundamental concepts, principles and processes underlying the academic field of chemistry, its different subfields (analytical, inorganic, organic and physical), and its linkages with related disciplinary areas/subjects;

PSO 2 Demonstrate procedural knowledge that creates different types of professionals in the field of chemistry and related fields such as pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.;

PSO 3 Employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact of chemistry on the environment and the society.

PSO 4 Use chemical techniques relevant to academia and industry, generic skills and global competencies, including knowledge and skills that enable students to undertake further studies in the field of chemistry or a related field, and work in the chemical and non-chemical industry sectors.

PSO5 Undertake hands on lab work and practical activities which develop problem solving abilities required for successful career in pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.

PSO 6 Understand safety of chemicals, transfer and measurement of chemical, preparation of solutions, and find out the green route for chemical reaction for sustainable development.

PSO 7 Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

COURSE STRUCTURE FOR CHEMISTRY (UG) PROGRAMME
2019 ADMISSION

SEMESTER I

No.	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course I	5	4	10	40	50
2	English Common Course II	4	3	10	40	50
3	Additional Common Course I	4	4	10	40	50
4	Core Course 1 (Theoretical & Inorganic Chemistry)	2	2	10	40	50
5	Core Course 2 Practical I Part 1	2	-	-	-	-
6	ComplementaryElective -I (Course I)	2	2	8	32	40
7	Complementary Elective Practical	2	-	-	-	-
8	Complementary Elective -II (Course I)	4	3	10	40	50
	Total	25	18	58	232	290

SEMESTER-II

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course III	5	4	10	40	50
2	English Common Course IV	4	3	10	40	50
3	Additional Common Course- II	4	4	10	40	50
4	Core Course 3 (Analytical and Inorganic chemistry– I)	2	2	10	40	50
5	Core Course 2, Practical I - Part 2	2	3	10	40	50
6	Complementary Elective – I (Course II)	2	2	8	32	40
7	Complementary Elective Practical	2	-	-	-	-
8	Complementary Elective -II (CourseII)	4	3	10	40	50
	Total	25	21	68	272	340

SEMESTER-III

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course V	5	4	10	40	50
2	Additional Common Course- III	5	4	10	40	50
3	Core Course4 (Organic Chemistry I)	3	3	10	40	50
4	Core Course 5 Practical 2,Part I	2	-	-	-	-
5	Complementary Elective -1(CourseIII)	3	2	8	32	40
6	Complementary Elective Practical	2	-	-	-	-
7	Complementary Elective -II (CourseIII)	5	3	10	40	50
	TOTAL	25	16	48	192	240

SEMESTER-IV

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course VI	5	4	10	40	50
2	Additional Common Course- IV	5	4	10	40	50
3	Core Course 6(Organic Chemistry II)	3	3	10	40	50
4	Core Course 5 Practical 2,Part II	2	3	10	40	50
5	Complementary Elective -1(CourseIV)	3	2	8	32	40
6	Complementary ElectivePractical	2	4	8	32	40
7	Complementary Elective -II (CourseIV)	5	3	10	40	50
	TOTAL	25	23	66	264	330

SEMESTER-V

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	Generic Elective Course	2	2	5	20	25
2	Core Course 7 Analytical and Inorganic Chemistry-II	3	4	10	40	50
3	Core Course 8 (Inorganic Chemistry)	3	4	10	40	50
4	Core Course 9 (Physical Chemistry-I)	3	4	10	40	50
5	Core Course 10 (Physical Chemistry-II)	3	4	10	40	50
6	Core Course 11,Practical 3	5	-	-	-	-
7	Core Course 12, Practical 4	5	-	-	-	-
8	Core Course 13 Project/Industrial Visit	**1**	-	-	-	-
	TOTAL	25	18	45	180	225

SEMESTER-VI

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	Core Course 14 (Organic Chemistry-III)	4	4	10	40	50
2	Core Course 15 (Physical Chemistry-III)	**4**	3	10	40	50
3	Core Course 16 (Physical methods In Chemistry)	3	3	10	40	50
4	Core Course 17 Discipline Specific Elective Course	3	3	10	40	50
5	Core Course 18, Practical 5	3	3	10	40	50
6	Core Course 11& 12 Practical 3& 4	7	6	10+ 10	40+ 40	50+ 50
7	Core Course 13 Project Industrial Visit	**1**	2	4	16+ 5	25
	TOTAL	25	24	74	301	375

First Complementary Elective –Physics, Second Complementary Elective-Mathematics

Total Credit 120

Total Marks 1800

Scheme of Mark distribution - B Sc Chemistry Programme

Course	No.of Papers	Marks per paper	Total Marks
English Common Course	6	50	300
Additional Common Course	4	50	200
ComplementaryElective Course -Physics	5(4 Theory +1Practical)	40	200
Complementary Elective Course -Mathematics	4	50	200
Core Course-Chemistry	17(12Theory +5Practicals)	50	850
Project	1	25	25
Generic Elective Course	1	25	25

Credit distribution - B Sc Chemistry Programme (Semester I to VI)

Programme	Sem.	Common*		Core	ComplementaryElective Course		Generic Elective Course	Total
		Eng	Addl	Chemistry	Mathematics	Physics		
BSc (Chemistry)	I	4+3	4	2	3	2		18
	II	4+3	4	2+3	3	2		21
	III	4	4	3	3	2		16
	IV	4	4	3+3	3	2+4		23
	V			4+4+4+4			2	18
	VI			4+3+3+3+3+3+3+2				24
	Total	22	16	56	12	12	2	120

Components of Core (Chemistry)

The core courses of BSc Chemisty Programme will consists of the following components.

Theory
Practical
Project (Investigatory)
Study tour (Visiting Factory/ science institute/laboratory).

Scheme of Core course (Chemistry)

No.	Semester	Course code	Title of the Course	Credits	Contact hr/week
1	I	1B01CHE	Theoretical and Inorganic Chemistry	2	2
2	II	2B03CHE	Analytical and Inorganic chemistry-I	2	2
3	II	1B02CHE/PCH & 2B02CHE/PCH	*Core Course Practical I Volumetric Analysis	3	2—I Sem 2—II Sem
4	III	3B04CHE/PCH	Organic Chemistry-I	3	3
5	IV	4B06CHE/PCH	Organic Chemistry-II	3	3
6	IV	3B05CHE/PCH & 4B05CHE/PCH	*Core Course Practicals 2 Inorganic Qualitative Analysis	3	2—III Sem 2—IV Sem
7	V	5B07CHE/PCH	Analytical and Inorganic chemistry-II	4	3
8	V	5B08CHE/PCH	Inorganic Chemistry	4	3
9	V	5B09CHE/PCH	Physical Chemistry- I	4	3
10	V	5B10CHE/PCH	Physical Chemistry- II	4	3
11	VI	6B14CHE/PCH	Organic Chemistry III	4	4
12	VI	6B15CHE/PCH	Physical Chemistry III	3	4
13	VI	6B16CHE/PCH	Physical Methods in Chemistry	3	3
14	VI	6B17CHE/PCH	Discipline Specific Elective Course	3	3
15	VI	5B11CHE/PCH 6B11CHE/PCH	*Core Course Practicals 3 Gravimetric Analysis	3	5—V Sem 4—VI Sem
16	VI	5B12CHE/PCH 6B12CHE/PCH	*Core Course Practicals 4 Organic Chemistry	3	5---V Sem 3---VI Sem
17	VI	6B18CHE/PCH	*Core Course Practicals5 Physical Chemistry	3	3
18	VI	5B13CHE/PCH 6B13CHE/PCH	Project & Industrial Visit	2	1—SemV 1---Sem VI

* External examination will be held at the end of II/ IV/VI semester

Scheme for Discipline Specific Elective Course

No	Semester	Course code	Title of the course	Contact hour/ Week	Credit
1	VI	6B17CHE/PCH-A	Environmental Chemistry	3	3
2	VI	6B17CHE/PCH-B	Applied Chemistry	3	3
3	VI	6B17CHE/PCH-C	Polymer Chemistry	3	3
4	VI	6B17CHE/PCH-D	NanoChemistry	3	3

Scheme forComplementaryElective Course (Chemistry)

No	Semester	Course code	Title of the course	Contact hour/ week	Credit
1	I	1C01CHE/PCH	Chemistry (For Physical & Biological Sciences)	2	2
2	II	2C02CHE/PCH	Chemistry (For Physical & Biological Sciences)	2	2
3	III	3C03CHE/PCH(BS)	Chemistry (For Biological Science)	3	2
4	III	3C03CHE/PCH(PS)	Chemistry (For Physical Science)	3	2
5	IV	4C04CHE/PCH(BS)	Chemistry (For Biological Science)	3	2
6	IV	4C04CHE/PCH(PS)	Chemistry (For Physical Science)	3	2
5	I,II, III&IV	4C05CHE*/PCH	ComplementaryElective Course practical	2	4

* External examination will be conducted at the end of IV semester.

Scheme of Generic Elective Course

The Generic Elective course is meant for all the students in the institution except the students of BSc Chemistry Programme. External examination will be conducted at the end of Vth semester.

Options available for Generic Elective course (Chemistry)

No	Semester	Course code	Title of the course	Contact hour/ week	Credit
1	V	5D01CHE/PCH	Chemistry in Service to man	2	2
2	V	5D02CHE/PCH	Drugs-Use & Abuse	2	2
3	V	5D03CHE/PCH	Environmental Studies	2	2
4	V	5D04CHE/PCH	Nanomaterials	2	2
5	V	5D05CHE/PCH	Chemistry in Every day life	2	2

Evaluation pattern

Mark system will be followed instead of direct grading for each question. For each course in the semester letter grade, grade point and % of marks are introducedin 7-point indirect grading system as per KUCBCSSUG 2019. Accordingly 20% of the total marks in each course are for internal evaluation and the remaining 80% for external evaluation.

Internal Evaluation (Core , Complementary Elective & Generic Elective)
Components with percentage of marks of Internal Evaluation of theory

Test papers-60%

Seminar/Viva-40%

Internal evaluation isconducted bythe concerned Department in mark system. Marks secured for internal evaluation need be send to University.

External Evaluation (Core , Complementary Elective & Generic Elective)
External assessment will include Theory, Practical and Project evaluation conducted by University after the completion of a semester. Duration of theory examination for Core &Complementary courses will be 3 hours, whereas for Generic Elective course is 2 hours. The practical examination for Core Course Practical I- Volumetric Analysis will be 3 hours and other Core &Complementary Elective practical exam will be of 4 hour duration.

Project work:

Project works will be carried out in fifth and sixth semesters. Not more than five students can form a group and undertake a project. Each individual student should submit a copy of the project report duly attested by the supervising teacher and Head of the department. The report has to be presented at the time of practical examination conducted at the end of VI semester for evaluation.

Study tour:

Students are required to visit a factory/Laboratory/Research Institute of repute during the course and have to submit the report of the study tour at the end of the sixth semester during the time of practical examination. No credit will be separately given for study tour report.

Practical record, Project report & Study tour report must be certified by the teacher in charge and countersigned by the Head of the Department. Students should submit certified record of respective practical work at the time of University practical examination.

Mark distributions

Table 1: Internal and External marks for Core (Chemistry) courses:

Item	Marks		Total
	Internal	External	
Theory	10	40	50
Practical	10	40	50
Industrial visit	--	5	5
Project	4	16	20

Table 2: Internal and External marks for ComplementaryElective Course (Chemistry)

Item	Marks		Total
	Internal	External	
Theory	8	32	40
Practical	8	32	40

Table 3: Internal and External marks for Generic Elective Course (Chemistry)

Item	Marks		Total
	Internal	External	
Theory	5	20	25

Table 4: Distribution of Internal marks for Theory courses (Core, Complementary Elective & Generic Elective)

Seminar/Viva	40%
*Test paper	60 %

* At least two test papers are to be conducted and average of these two is to be taken for awarding mark.

Table 5: Distribution of Internal marks for Practical courses

Record + Lab involvement*	50%
Test papers/ Viva	50%

*On completion of each experiment, a report should be presented to the course teacher. It should be recorded in a bound note-book. The experimental description should include aim, principle, materials/apparatus required/used, method/procedures, and tables of data collected, equations, calculations, graphs, and other diagrams etc. as necessary and final results.

Table 6: Distribution of internal and external marks for Project

Internal (20% of Total)	%	External (80 % of total)	%
Punctuality	20 %	Relevance of Topic/Statement of Objectives and Methodology	20%
Use of data	20%	Presentation/Quality of analysis and findings	30 %
Scheme and Organization of report	30%	Viva Voce	50%
Viva Voce	30 %		

Distribution of Marks & type of questions for Core Course

<u>Marks including choice</u>:

Unit	Marks

Table 7. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

Distribution of Marks & type of questions for Complementary Elective Course
Marks including choice:

Unit	Marks

Table 8. Type of Questions & Marks for External Examination- ComplementaryElective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

Distribution of Marks for Generic Elective Course
Marks including choice:

Unit	Marks

Table 9. Type of Questions & Marks for External Examination –Generic Elective Course

	Total Questions	No. Of Questions to be Answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

Guidelines for the Evaluation of Projects

1.Evaluation of the Project Report shall be done under Mark System.

2.The evaluation of the project will be done at two stages:

a) Internal Assessment(supervising teachers will assess the project and award Internal Marks)

b) External evaluation (external examiner appointed by the University)

c) Marks secured for the project will be awarded to candidates, combining the Internal and External Marks

3. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

Internal(20% of total)		External(80% of Total)	
Components	% of internal Marks	Components	% of internal Marks
Punctuality	20	Relevance of the topic, Statement of Objectives Methodology (Reference/ Bibliography)	20
Use of Data	20	Presentation, Quality of Analysis/Use of Statistical tools, Findings and recommendations	30
Scheme/Organization of Report	30	Viva-voce	50
Viva-Voce	30		

4. Internal Assessment should be completed 2 weeks before the last working day of VIthsemester.

5.Internal Assessment marks should be published in the department.

6.Project evaluation shall be done in the VI semester along with practical exams.

7. Chairman Board of Examinations, may at his discretion, on urgent requirements, make certainexception in the guidelines for the smooth conduct of the evaluation of project.

2.PASS CONDITIONS-

1. Submission of the Project Report and presence of the student for viva are compulsory for internal evaluation. No marks shall be awarded to a candidate if she/he fails to submit theProject Report for external evaluation.

2. The student should get a minimum of 40 % marks of the aggregate and 40% separately for ESE and 10% CE for pass in the project.

3. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re-done and the report may be re-submitted along with subsequent exams through parent department.

KANNUR UNIVERSITY

(Abstract)

B.Sc. Mathematics Programme-Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/13083/2019 Civil Station P.O, Dated 22/06/2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O No. Acad.C2/429/2017 Vol.II dated 03-06-2019
4. The Minutes of the Meeting of the Board of Studies in Mathematics held on 06/06/2019
5. Syllabus of B.Sc. Mathematics Submitted by the Chairperson, Board of Studies in Mathematics (UG)dated 21/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes, such as conducting the meeting of various Boards of Studies, Workshops, discussion etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Mathematics (UG) finalized the Scheme, Syllabus & Pattern of Question Papers for Core, Complementary Elective & Generic Elective Course of B.Sc.Mathematics Programme to be implemented with effect from 2019 Admission.

--2

5. As per paper read (5) above, the Chairperson, Board of Studies in Mathematics(UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc.Mathematics Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Papers (Core/Complementary Elective/Generic Elective Course) of the B.Sc.Mathematics programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Papers of the B.Sc. Mathematics Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To

The Principals of Colleges offering B.Sc. Mathematics programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Mathematics (UG)
3. PS to VC/PA to PVC/PA to Registrar
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SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, MATHEMATICS (UG)

SYLLABUS FOR
MATHEMATICS CORE COURSE, COMPLEMENTARY ELECTIVE COURSES AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY
VISION AND MISSION STATEMENTS

Vision

To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavours.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO 1. Critical Thinking

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2. Effective Citizenship

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3. Effective Communication

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4. Interdisciplinarity

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Modern education is facing challenges to cater to the requirements of the expanding world of knowledge and information. Research studies in Basic Sciences, especially in Mathematics is to be encouraged in our country. Novel developments in the field of Mathematics are to be incorporated into the syllabus so as to cope with the challenges of ever growing field of knowledge.

The UG Board of Studies in Mathematics has designed a syllabus that familiarizes the students with the basic concepts of the subject. It helps the students to meet the current employment requirements and provides them ample scope for further study in the subject. The syllabi for Core Courses, Complementary Elective Courses and Generic Elective Courses promote self learning through assignments, seminars and project work in addition to class room learning.

The syllabus and curriculum has been prepared after concerted efforts and deliberations at various levels and it meets the programme specific outcomes. The reference materials have been recommended after a thorough study. The Board of Studies puts forward this syllabus for implementation from 2019 admission onwards. We thank all those who have helped us by giving critical suggestions for improvement.

Dr. C.P. Santhosh
Chairman
UG Board of Studies in Mathematics
Kannur University

KANNUR UNIVERSITY

PROGRAMME SPECIFIC OUTCOMES OF B.SC. MATHEMATICS PROGRAMME

PSO 1: Understand the basic concepts and tools of Mathematical logic, Set theory, Number theory, Geometry, Calculus, Algebra, Abstract structures, Linear Algebra, Analysis, Laplace transforms, Fourier series, Graph theory, and Optimization and methods of proofs.

PSO 2: Model real world problems into Mathematical problems and find solutions and understand the application of Mathematics in other Sciences and Engineering.

INDEX

KANNUR UNIVERSITY

BSc MATHEMATICS PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title	Credits	Hours per week	Total Credits	Total Hours
I	English Common Course 1	4	5	20	25
	English Common Course 2	3	4		
	Additional Common Course 1	4	4		
	Core Course 1	4	4		
	First Complementary Elective Course 1	3	4		
	Second Complementary Elective Course 1	2	4		
II	English Common Course 3	4	5	20	25
	English Common Course 4	3	4		
	Additional Common Course 2	4	4		
	Core Course 2	4	4		
	First Complementary Elective Course 2	3	4		
	Second Complementary Elective Course 2	2	4		
III	English Common Course 5	4	5	17	25
	Additional Common Course 3	4	5		
	Core Course 3	4	5		
	First Complementary Elective Course 3	3	5		
	Second Complementary Elective Course 3	2	5		
IV	English Common Course 6	4	5	21	25
	Additional Common Course 4	4	5		
	Core Course 4	4	5		
	First Complementary Elective Course 4	3	5		
	Second Complementary Elective Course 4 (T+P)	6(2+4)	5		
V	Core Course 5	4	4	21	25
	Core Course 6	4	5		
	Core Course 7	4	5		
	Core Course 8	3	4		
	Core Course 9	4	5		
	Generic Elective Course	2	2		
VI	Core Course 10	4	5	21	25
	Core Course 11	4	5		
	Core Course 12	4	5		
	Core Course 13	4	5		
	Core Course 14 (Discipline Specific Elective Course)	3	5		
	Project	2	---		
Total				**120**	

CREDIT DISTRIBUTION STATEMENT

Course	Credit
English Common Course	22
Additional Common Course	16
Core Course	56
First Complementary Elective Course - Statistics	12
Second Complementary Elective Course - Physics/Computer Science	12
Generic Elective Course	2
Total	**120**

KANNUR UNIVERSITY

(Abstract)

B.Sc. Physics Programme-Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/12291/2019 Dated, Civil Station P.O 21/ 06/ 2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated 10-10-2017

2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.

3. U.O No. Acad.C2/429/2017 Vol.II dated 03-06-2019

4. The Minutes of the Meeting of the Board of Studies in Physics(UG) held on 06/06/2019

5. Syllabus of B.Sc Physics Programme Submitted by the Chairperson, Board of Studies in Physics (UG) dated 12.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG Programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies and Workshops, discussion etc.

3. The Revised Regulation for UG Programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently ,as per paper read (4) above, the Board of Studies in Physics (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc. Physics Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Physics (UG) submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers ofB.Sc. Physics Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc. Physics Programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.Sc. Physics Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To

The Principals of Colleges offering B.Sc. Physics programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in B.Sc. Physics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES -PHYSICS (UG)

SYLLABUS FOR PHYSICS CORE, COMPLEMENTARY ELECTIVE & GENERIC ELECTIVE COURSES OF BSc PROGRAMME

CHOICE BASED CREDIT AND SEMESTER SYSTEM
(OBE – Outcome Based Education – system)

(2019 ADMISSION ONWARDS-)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- ➢ To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- ➢ To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- ➢ To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- ➢ To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- ➢ To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- ➢ To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY
PROGRAMME OUTCOMES (PO)

PO 1.Critical Thinking:

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

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2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

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4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The Board of Studies in Physics (UG) strives to offer students with a solid scientific and technical foundation and to promote them to build up vision in tackling problems and seeking solutions through the reformed outcome based curriculum and syllabus. This curriculum and syllabus clearly states the graduate attributes/outcomes and is developed after numerous workshops and discussions with different stakeholders.

The B.Sc. Physics degree course will open up exciting higher studies/employment opportunities for students. The course offers essential knowledge in theoretical Physics as well as practical knowledge to the students to apply it in real-life state of affairs. B.Sc. Physics aspirant needs to have basic knowledge in mathematical tools and techniques to pursue various courses in this programme.

The teachers should place much greater emphasis on supporting curricular activities aimed for achieving the desired attributes and programme outcomes, even if these are not part of the end semester examinations. Rote learning should be discouraged. The act of seeking new information and creation of new knowledge should be encouraged.

Appropriate three-day induction programmes/bridge courses can be offered to the first year B.Sc. Physics students to cope with the UG programme in Physics. The concerned Department/Institution has a flexibility to frame/adopt the bridge courses by adjusting the teaching hours accordingly.

The Board of Studies in Physics (UG) considered the introduction of outcome based curriculum and syllabus in affiliated colleges for the UG programme in Physics and resolved to implement the same from 2019 admission onwards.

Sheela M Joseph
Chairperson
Board of Studies,Physics (UG)
Kannur University

Kannur University
Programme Specific Outcome of BSc Physics Programme

PSO1: Understand and apply the principles of Classical mechanics, Quantum mechanics, Thermodynamics, Nuclear physics and Electrodynamics

PSO 2: Understand and apply the principles of Solid state physics, Optics, Photonics and Spectroscopy

PSO 3: Understand the principles of Electronics, Design and test electronic circuits

PSO 4: Understand and apply the principles of Mathematical Physics and Computational Physics and do Error analysis in measurements

INDEX

KANNUR UNIVERSITY BSc PHYSICS PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

(**BSc:Common English: 22, Additional Common: 16, Core: 56,**

First complementary Elective: 12,Second complementary Elective:12, Generic Elective: 2)

Semester	**Course Title***	**Credits**	**Hours per week**	**Total Credits**	**Total Hours**
I	Common Course(English)I	4	5	18	25
	Common Course(English)II	3	4		
	Common Course (Addl Lang) VII	4	4		
	Core Course(Theory 1B01PHY)	2	2		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths I	3	4		
	Second Complementary Elective Theory I	2	2		
	Second Complementary Elective Practical I *	-	2		
II	Common Course(English)III	4	5	18	25
	Common Course(English)IV	3	4		
	Common Course (Addl Lang) VIII	4	4		
	Core Course(Theory 2B02PHY)	2	2		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths II	3	4		
	Second Complementary Elective Theory II	2	2		
	Second Complementary Elective Practical I *	-	2		
III	Common Course(English)V	4	5	16	25
	Common Course (Addl Lang) IX	4	5		
	Core Course(Theory 3B03PHY)	3	3		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths III	3	5		
	Second Complementary Elective Theory III	2	3		
	Second Complementary Elective Practical I *	-	2		
IV	Common Course(English)VI	4	5	24	25
	Common Course (Addl Lang) X	4	5		
	Core Course(Theory 4B04PHY)	3	3		
	Core Course(Practical 4B05PHY)	4	2		
	First Complementary Elective Theory Maths IV	3	5		
	Second Complementary Elective Theory IV	2	3		
	Second Complementary Elective Practical I	4	2		

V	Generic Elective Course!!	2	2	17	25
	Core Course (Theory-5B06PHY)	4	4		
	Core Course (Theory-5B07PHY)	4	4		
	Core Course (Theory-5B08PHY)	4	4		
	Core Course (Theory-5B09PHY)	3	3		
	Core Course (Practical II-6B15PHY**)	-	4		
	Core Course (Practical III 6B16PHY**)	-	4		
VI	Core Course (Theory-6B10PHY)	4	4	27	25
	Core Course (Theory-6B11PHY)	4	4		
	Core Course (Theory-6B12PHY)	4	4		
	Core Course (Theory-6B13PHY)	3	3		
	Discipline Specific elective 6B14PHY)	2	2		
	Core Course (Practical II-6B15PHY)	4	4		
	Core Course (Practical III 6B16PHY)	4	4		
	Project&Study Tour*** 6B17PHY	2	-		
Total				120	150

* External examination will be conducted at the end of Fourth Semester
** External examination will be conducted at the end of Sixth Semester
*** Study tour report (Industrial visit/ Scientific Institution visit) should be submitted along with the project report
!!Generic elective courses offered by Physics is shown in PART C

First Complementary Elective (Compulsory): Mathematics

Second Complementary Elective: Chemistry/ Electronics/ Computer Science

PART A:
PHYSICS CORE COURSES
WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

course code	Course title	Sem	Hours per week	Credit	Exam hours	Marks		
						CE	ESE	Total
1B01PHY	MECHANICS I	I	2	2	3	10	40	50
2B02PHY	MATHEMATICAL PHYSICS AND ERROR ANALYSIS	II	2	2	3	10	40	50
3B03PHY	MECHANICS II	III	3	3	3	10	40	50
4B04PHY	ELECTRONICS I	IV	3	3	3	10	40	50
4B05PHY	GENERAL PHYSICS PRACTICAL I*	IV	2	4	3	10	40	50
5B06PHY	QUANTUM MECHANICS	V	4	4	3	10	40	50
5B07PHY	ELECTROSTATICS AND MAGNETOSTATICS	V	4	4	3	10	40	50
5B08PHY	THERMODYNAMICS AND STATISTICAL MECHANICS	V	4	4	3	10	40	50
5B09PHY	ELECTRONICS II	V	3	3	3	10	40	50
6B10PHY	SOLID STATE PHYSICS AND SPECTROSCOPY	VI	4	4	3	10	40	50
6B11PHY	OPTICS AND PHOTONICS	VI	4	4	3	10	40	50
6B12PHY	NUCLEAR, PARTICLE & ASTROPHYSICS	VI	4	4	3	10	40	50
6B13PHY	ELECTRODYNAMICS AND CIRCUIT THEORY	VI	3	3	3	10	40	50
6B14PHY	DISCIPLINE SPECIFIC ELECTIVE !	VI	2	2	3	10	40	50
6B15PHY	GENERAL PHYSICS PRACTICAL II**	VI	4	4	3	10	40	50
6B16PHY	ELECTRONICS PRACTICAL III**	VI	4	4	3	10	40	50
6B17PHY	PROJECT*** &STUDY TOUR	VI	-	2	-	5	20	25

*****External examination will be conducted at the end of Fourth Semester
** External examination will be conducted at the end of Sixth Semester
***External examination will be conducted at the end of Sixth Semester.

Study tour report (Industrial visit/ Scientific Institution visit) should be submitted along with the project report.
!Options available are listed in table I

Table I

COURSE CODE	COURSE TITLE
6B14 PHY(1)	**PYTHON PROGRAMMING**
6B14 PHY(2)	**NANOSCIENCE**
6B14 PHY(3)	**MATERIAL SCIENCE**
6B14 PHY(4)	**COSMOLOGY**
6B14 PHY(5)	**PLASMA PHYSICS**

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS INTERNAL ASSESSMENT-THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1 Test paper	60%	Best of two
COMPONENT 2 Open book problem solving/Seminar/Viva	40%	One

CONTINUOUS INTERNAL ASSESSMENT- PRACTICAL

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT 1 Lab Skill	25%	
COMPONENT 2 Punctuality	25%	
COMPONENT 3 Record	25%	A logbook of practicals should be maintained which must include theory,observation,tabulation,calculation ,graph ,result etc
COMPONENT 4 Examination	25%	A model exam should be conducted before external examination & considered for internals

CONTINUOUS INTERNAL ASSESSMENT- PROJECT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT 1 Topic	20%	Relevance of topic
COMPONENT 2 Punctuality	20%	
COMPONENT 3 Scheme & report	20%	
COMPONENT 4 Viva-voce	20%	
COMPONENT 5 Study tour report	20%	Industrial visit/ Scientific Institution visit

KANNUR UNIVERSITY
(Abstract)

Bachelor of Business Administration (BBA) Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12392/2019 Dated, Civil Station P.O.,22 .06. 2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
4. The Minutes of the Meeting of the Board of Studies in Management Studies (UG) held on 07.06.2019
5. Syllabus of BBA Programme , Submitted by the Chairperson, Board of Studies in Management Studies (UG), dated , 13.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies ,Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Management Studies (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core,

Complementary Elective & Generic Elective Course of BBA Programme to be implemented with effect from 2019 Admission.

5. Further, as per paper read (5) above, the Chairperson, Board of Studies in Management Studies (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of BBA Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Papers (Core/Complementary Elective/Generic Elective Course) of BBA Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Papers of BBA Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering BBA Programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Management Studies (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, Management Studies (UG)

BACHELOR OF BUSINESS ADMINISTRATION PROGRAMME
(BBA)

CHOICE BASED CREDITAND SEMESTER SYSTEM
(CBCSS)
Under
Outcome Based Education
(OBE)

(2019 ADMISSION ONWARDS)

Kannur University

Vision and Mission Statement*

Proposed Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady taluk of Wayanad Revenue District.

Proposed Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

Kannur University
Programme Outcomes

PO 1.Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation’s and region’s history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

Preface

The BBA Programme aims at equipping the students with new ideas and changes in the sphere of business and management. It is imperative to update the syllabus to impart the latest developments in business world and changing the view of our students about the global changes.

In the light of UGC guidelines and Higher Education Council's directives, the programme curriculum has been revised to meet the requirements of the modern time. The present revision aims at familiarizing students with latest practices in management in the area of finance, human resource development and marketing. It also aims at acquiring skills in accounting and quantitative techniques in the areas of decision making and management, and building entrepreneurial spirit and competencies, and develops research aptitude.

Dr. BINDU K
Chairperson
Board of Management Studies UG

BACHELOR OF BUSINESS ADMINISTRATION PROGRAMME (BBA)

Programme Specific Outcome
of
Bachelor of Business Administration Programme

PSO 1:
Gain knowledge and skills in the areas of Management principles and practices, finance, human resource management and marketing

PSO 2:
Acquire knowledge in accounting principles and practices and its application in real business settings

PSO 3:
Apply concepts, theories, tools and techniques of statistics, information techniques, economics and numerical skills for decision making

PSO 4:
Build entrepreneurial spirit, develop research attitude and entrepreneurial competencies and managerial abilities

INDEX

KANNUR UNIVERSITY

BBA PROGRAMME

Credit and courses			
Sl no	Category of course	Number of courses	Credits
1	English Common course(ECC)	2×4 =8 2×3=6	14
2	Additional Common course(ACC)	2×4=8	8
3	General Awareness Course Ability Enhancement Course (AEC) Skill Enhancement Course (SEC)	2×4=8 2×4=8	16
4	Core course(CC) Discipline Specific Elective course (DSEC)		64
5	Complementary elective Course(CEC)	4×4=16	16
6	Generic Elective Course(GEC)	1×2=2	2
Total			**120**

Semester	**Course Title***	Type of Course	**Credits**	**Hours per week**	**Total Credits**	**Total Hours**
I	English Common Course I	ECC	4	5	22	25
	English Common Course II	ECC	3	4		
	Additional Common Course I	ACC	4	5		
	Core Course I. Principles and Practices of Management	CC	3	3		
	Complementary Elective Course 1 Statistics for business decisions	CEC	4	4		
	Complementary Elective Course 2 Managerial Economics	CEC	4	4		
II	English Common Course III	ECC	4	5	21	25
	English Common Course IV	ECC	3	4		
	Additional Common Course II	ACC	4	5		
	Core Course 2 Business Environment	CC	2	3		
	Core Course 3 Entrepreneurship Development	CC	4	4		
	Complementary Elective Course 3 Quantitative Technique for Business Decisions	CEC	4	4		

III	Skill Enhancement Course I Numerical skills	SEC	4	5	20	25
	Ability Enhancement Course I Personality development and communication skills	AEC	4	4		
	Core Course 4 Financial Accounting	CC	4	6		
	Core Course 5 Marketing Management	CC	4	5		
	Complementary Elective Course 4 Legal Aspects Business	CEC	4	5		
IV	Core Course 6 Human Resource Management	CC	4	6	21	25
	Core Course 7 Financial Management	CC	4	5		
	Core Course 8 Operations management	CC	4	5		
	Core Course 9 Industrial Visit and Report	DSEC	1	0		
	Skill Enhancement Course II IT Tools for business	SEC	4	5		
	Ability Enhancement Course II Environmental studies	AEC	4	4		
V	Core Course 10 Business Research Methods	CC	4	5	18	25
	Core Course 11 Accounting for management	CC	4	6		
	Core Course 12 Elective I	DSE	4	6		
	Core course 13 Elective II	DSE	4	6		
	Generic Elective Course	GEC	2	2		
VI	Core Course 14 Organisation Behaviour	CC	4	6	18	25
	Core Course 15 Banking Theory and Practice	CC	4	5		
	Core Course 16 Project Report and viva voce	CC	2	2		
	Core Course 17 Elective III	DSE	4	6		
	Core Course 18 Elective IV	DSE	4	6		
Total					120	150

PART A:
BBA CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1B01BBA	Core Course I. Principles And Practice Of Management	I	3	3	3
2B02BBA	Core Course 2 Business Environment	II	3	2	3
2B03BBA	Core Course 3 Entrepreneurship Development	II	4	4	3
3B04BBA	Core Course 4 Financial Accounting	III	6	4	3
3B05BBA	Core Course 5 Marketing Management	III	5	4	3
4B06BBA	Core Course 6 Human Resource Management	IV	6	4	3
4B07BBA	Core Course 7 Financial Management	IV	5	4	3
4B08BBA	Core Course 8 Operations Management	IV	5	4	3
4B09BBA	Core Course 9 Industrial Visit And Report	IV	0	1	-
5B10BBA	Core Course 10 Business Research Methods	V	5	4	3
5B11BBA	Core Course 11 Accounting For Management	V	6	4	3
5B12BBA	Core 12 Elective I	V	6	4	3
5B13BBA	Core 13 Elective II	V	6	4	3
6B14 BBA	Core Course 14 Organisation Behaviour	VI	6	4	3
6B15BBA	Core Course 15 Banking Theory and Practice	VI	5	4	3
6B16BBA	Core Course 16 Project Report and Viva Voce Examination	VI	2	2	-
6B17BBA	Core Course 17 Elective III	VI	6	4	3
6B18BBA	Core Course 18 Elective IV	VI	6	4	3

DISCIPLINE SPECIFIC ELECTIVE COURSES

1 FINANCE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Advanced Financial Management	V	6	4	3
5B13BBA	Income tax law and Practice	V	6	4	3
6B17BBA	Insurance and Risk management	VI	6	4	3
6B18BBA	Stock And Commodity Markets	VI	6	4	3

II HUMAN RESOURCE MANAGEMENT

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Human Resource Development	V	6	4	3
5B13BBA	Performance and Compensation Management	V	6	4	3
6B17BBA	Counselling and negotiation skills for managers	VI	6	4	3
6B18BBA	Organisational Change and Development	VI	6	4	3

III MARKETING

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Consumer Behaviour	V	6	4	3
5B13BBA	Advertising and Brand Management	V	6	4	3
6B17BBA	Logistics Management	VI	6	4	3
6B18BBA	Retail Management	VI	6	4	3

PART B
GENERAL AWARENESS COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
3A11BBA	Skill Enhancement Course I Numerical Skills	III	5	4	3
3A12BBA	Ability Enhancement Course I Personality Development and Communication Skills	III	4	4	3
4A13BBA	Skill Enhancement Course II IT Tools For Business	IV	Theory 3 Practical 2	4	2
4A14BBA	Ability Enhancement Course II Environmental Studies	IV	4	4	3

PART C
COMPLEMENTARY ELECTIVE COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1C01BBA	Statistics for business decisions	I	4	4	3
1C02BBA	Managerial Economics	I	4	4	3
2C03BBA	Quantitative Techniques For Business Decisions	II	4	4	3
3C04BBA	Legal Aspects Of Business	III	5	4	3

GENERIC ELECTIVE COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5D01BBA	Customer Relationship Management	V	2	2	2
5D02BBA	Service Marketing	V	2	2	2
5D03BBA	E- Commerce	V	2	2	2
5D04BBA	Event Management	V	2	2	2
5D05BBA	Disaster Management	V	2	2	2

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4 (40 MARKS)
INTERNAL	1(10 MARKS)

*20 marks for theory and 20 marks for practical for courses having practical (IT in business)

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT1 INTERNAL TEST	2	TWO TESTS (6 MARKS)
COMPONENT 2 ASSINGMENT/SEMINAR/VIVA	1	INDIVIDUAL OR GROUP (4 MARKS)

EVALUATION FOR GENERIC ELECTIVE

ASSESSMENT	WEIGHTAGE
EXTERNAL	4 (20 MARKS)
INTERNAL	1(5 MARKS)

KANNUR UNIVERSITY

(Abstract)

Bachelor of Computer Application (BCA) Programme- Scheme, Syllabus and Pattern of Question Papers of Core and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/12371/2019/i

Civil Station P.O, Dated 21/06/2019

Read:-
1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O No.Acad.C2/429/2017 Vol.II dated 03-06-2019
4. The Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 07-06-2019
5. Syllabus of Bachelor of Computer Application (BCA) submitted by the Chairperson, Board of Studies in Computer Science (UG) dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies , Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Computer Science (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core & Generic Elective of Bachelor of Computer Application (BCA) Programme to be implemented with effect from 2019 Admission.

--2

5. As per paper read (5) above, the Chairperson, Board of Studies in Computer Science (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of Bachelor of Computer Application (BCA) Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core /Generic Elective Course) of Bachelor of Computer Application (BCA)programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to report before the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of Bachelor of Computer Application (BCA) Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To

The Principals of Colleges offering BCA
(Bachelor of Computer Application programme)

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Computer Science (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES-COMPUTER SCIENCE (UG)

SYLLABUS FOR
BACHELOR OF COMPUTER APPLICATIONS(B C A)
COREAND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTERSYSTEM
(OBE-Outcome Based Education System)

(2019 ADMISSION ONWARDS)

Kannur University

Vision and Mission Statement

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manantavadytaluk of Wayanad Revenue District”

Mission:

- ➢ To produce anddisseminate new knowledge and to find novel avenues for application of such knowledge.
- ➢ To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- ➢ To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- ➢ To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- ➢ To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.
- ➢ To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

Programme Outcomes (PO)

PO 1.Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminationsand empathetic social awareness about various kinds of marginalization.
3. Internalize certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernization of the post-colonial society.

PO 3.Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The Board of Studies in Computer Science bears deep academic venture and curriculum vision in forming the syllabus for undergraduate programme of Kannur University. The curriculum and syllabus pinpoint the creation of technical caliber of students through class room learning, workshops, seminars, presentations and summative and formative assessments.

As the present era moves with advancements in Science and Technology, the Board of Studies in computer Science of Kannur University predominantly emphasize employment-based curriculum formation to make the students extremely competent in global scenario.

Recent algorithms, Networks, Operating Systems etc. are the crux of vast developing technical dimensions of the computer science and Engineering. This curriculum and syllabus clearly states the graduate attributes/Outcomes and is developed after numerous workshops and discussions with different stakeholders.The Board of Studies in Computer Science has resolved to introduce the syllabus in the affiliated colleges for UG programme from 2019 admission onwards.I place records of gratitude to the members of board of studies,Faculties and stake holders to help me in the formation of syllabus.

Lt.ThomasScaria

Chairperson

Board of Studies, Computer Science (UG)
Kannur University

KANNUR UNIVERSITY

Programme Specific Outcome of B.Sc. Computer Science Programme

PSO1	Understand the concepts of Computer Science and Applications.
PSO2	Understand the concepts of System Software and Application Software.
PSO3	Understand the concepts of Algorithms and Programming.
PSO4	Understand the concepts of Computer Networks.
PSO5	Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering.

KANNUR UNIVERSITY

BCA PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common Course – English I	4	5	19	25
	Common Course – English II	3	4		
	Common Course – Additional Language I	4	5		
	General Awareness Course I – 1A11BCA Informatics for Computer Applications	2	3		
	Core Course I – 1B01BCA Programming In C	2	2		
	Core Course IV – 2B04BCA Lab I: Programming In C*	0	2		
	Complementary Elective (Mathematics I)	4	4		
II	Common Course – English III	4	5	22	25
	Common Course – English IV	3	4		
	Common Course – Additional Language II	4	5		
	Core Course II – 2B02BCA Digital Systems	3	3		
	Core Course III – 2B03BCAObject Oriented Programming Using C++	2	2		
	Core Course IV – 2B04BCA Lab I: Programming In C*	1	0		
	Core Course V – 2B05BCA Lab II: Programming In C++*	1	2		
	Complementary Elective (Mathematics II)	4	4		
III	General Awareness Course II – 3A12BCA Data Structures	4	4	18	25
	General Awareness Course III – 3A13BCA Database Management System	4	4		
	Core Course VI – 3B06BCAIntroduction to Microprocessors	3	4		
	Core Course VII – 3B07BCAJava Programming	3	4		
	General Awareness Course V – 4A15BCA Lab III: Data Structure and DBMS**	0	3		
	Core Course XI – 4B11BCA Lab IV: Java Programming, Shell Programming & Linux Administration**	0	2		
	Complementary Elective (Mathematics III)	4	4		

IV	General Awareness Course IV – 4A14BCA Discrete Mathematical Structures	4	4	21	25
	Core Course VIII – 4B08BCA Operating Systems	3	4		
	Core Course IX – 4B09BCAComputer Organization	3	4		
	Core Course X – 4B10BCA Linux Administration	3	4		
	General Awareness Course V – 4A15BCA Lab III: Data Structure and DBMS**	2	2		
	Core Course XI – 4B11BCA Lab IV: Java Programming, Shell Programming & Linux Administration **	2	3		
	Complementary Elective (Mathematics IV)	4	4		
V	Core Course XII – 5B12BCASoftware Engineering	3	3	16	25
	Core Course XIII – 5B13BCAEnterprise Java Programming	4	4		
	Core Course XIV – 5B14BCA- Python Programming	2	2		
	Core Course XV – 5B15BCAWeb Technology	2	2		
	Core Course XVI – 5B16BCA Discipline Specific Elective I	3	4		
	Core Course XXI– 6B21BCA Lab V: Enterprise Java Programming***	0	3		
	Core Course XXII– 6B22BCA Lab VI: Python Programming***	0	3		
	Core Course XXIII– 6B23BCA Lab VII: Web Technology***	0	2		
	General Elective Course	2	2		
VI	Core Course XVII – 6B17BCA Design and Analysis of Algorithm	4	4	24	25
	Core Course XVIII – 6B18BCA Introduction to Compiler	3	4		
	Core Course XIX – 6B19BCA Data Communication & Networks	3	3		
	Core Course XX – 6B20BCA Discipline Specific Elective II	3	3		
	Core Course XXI– 6B21BCA Lab V: Enterprise Java Programming***	2	2		
	Core Course XXII– 6B22BCA Lab VI: Python Programming***	3	2		
	Core Course XXIII– 6B23BCA Lab VII: Web Technology***	2	2		
	Core Course XXIV – 6B24BCA Project	4	5		
Total				120	150

*External examination will be conducted at the end of second semester

**External examination will be conducted at the end of fourth semester

***External examination will be conducted at the end of sixth semester

Complementary Elective: Mathematics

Total Marks of the Programme- 1850 Marks (Eng 200 Marks, Additional Common Course 100 Marks, Core 1350, Complementary Elective 200 Marks)

PART A

BCACORE COURSES
WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS (INTERNAL + EXTERNAL)
1A11BCA	INFORMATICS FOR COMPUTER APPLICATIONS	1	3	2	3	10+40
1B01BCA	PROGRAMMING IN C	1	2	2	3	10+40
2B02BCA	DIGITAL SYSTEMS	2	3	3	3	10+40
2B03BCA	OBJECT ORIENTED PROGRAMMING USING C++	2	2	2	3	10+40
2B04BCA	LAB I: PROGRAMMING IN C	2	I SEM 2 II SEM 0	1	3	5+20
2B05BCA	LAB II: PROGRAMMING IN C++	2	2	1	3	5+20
3A12BCA	DATA STRUCTURES	3	4	4	3	10+40
3A13BCA	DATABASE MANAGEMENT SYSTEM	3	4	4	3	10+40
3B06BCA	INTRODUCTION TO MICROPROCESSORS	3	4	3	3	10+40
3B07BCA	JAVA PROGRAMMING	3	4	3	3	10+40
4A14BCA	DISCRETE MATHEMATICAL STRUCTURES	4	4	4	3	10+40
4B08BCA	OPERATING SYSTEMS	4	4	3	3	10+40
4B09BCA	COMPUTER ORGANIZATION	4	4	3	3	10+40
4B10BCA	LINUX ADMINISTRATION	4	4	3	3	10+40
4A15BCA	LAB III: DATA STRUCTURES AND DBMS	4	III SEM 3 IV SEM 2	2	3	5+20
4B11BCA	LAB IV: JAVA PROGRAMMING, SHELL PROGRAMMING & LINUX ADMINISTRATION	4	III SEM 2 IV SEM 3	2	3	5+20
5B12BCA	SOFTWARE ENGINEERING	5	3	3	3	10+40
5B13BCA	ENTERPRISE JAVA PROGRAMMING	5	4	4	3	10+40
5B14BCA	PYTHON PROGRAMMING	5	2	2	3	10+40
5B15BCA	WEB TECHNOLOGY	5	2	2	3	10+40
5B16BCA	DISCIPLINE SPECIFIC ELECTIVE I	5	4	3	3	10+40
5D--BCA	GENERIC ELECTIVE COURSE	5	2	2	2	5+20

6B17BCA	DESIGN AND ANALYSIS OF ALGORITHM	6	4	4	3	10+40
6B18BCA	INTRODUCTION TO COMPILER	6	4	3	3	10+40
6B19BCA	DATA COMMUNICATION & NETWORKS	6	3	3	3	10+40
6B20BCA	DISCIPLINE SPECIFIC ELECTIVE II	6	3	3	3	10+40
6B21BCA	LAB V: ENTERPRISE JAVA PROGRAMMING	6	V SEM 3 VI SEM 2	2	3	5+20
6B22BCA	LAB VI: PYTHON PROGRAMMING	6	V SEM 3 VI SEM 2	3	3	5+20
6B23BCA	LAB VII: WEB TECHNOLOGY	6	V SEM 2 VI SEM 2	2	3	5+20
6B24BCA	PROJECT	6	5	4	-	20+80
*AN INDUSTRIAL VISIT (STUDY TOUR) IS RECOMMENDED FOR THE PROJECT WORK						

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B16BCA-E01	INFORMATION SECURITY	5	4	3	3
5B16BCA-E02	MOBILE COMMUNICATIONS	5	4	3	3
5B16BCA-E03	C# AND .NET PROGRAMMING	5	4	3	3
5B16BCA-E04	BIO-INFORMATICS	5	4	3	3
6B20BCA-E01	DATA MINING AND DATA WAREHOUSING	6	3	3	3
6B20BCA-E02	NETWORK PROGRAMMING	6	3	3	3
6B20BCA-E03	DIGITAL IMAGE PROCESSING	6	3	3	3
6B20BCA-E04	CLOUD COMPUTING	6	3	3	3

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS INTERNAL ASSESSMENT FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	80%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE MARKS OBTAINED IN THE TESTS CONDUCTED.
COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	20%	ANY ONE COMPONENT

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**Short Answer**	**6 Questions x 1 Mark = 6 Marks**
	Answer all questions	6 Questions x 1 Mark = 6 Marks
Part B	**Short Essay**	**8 Questions x 2 Marks = 16 Marks**
	Answer any 6 questions	6 Questions x 2 Marks = 12 Marks
Part C	**Essay**	**6 Questions x 3 Marks = 18 Marks**
	Answer any 4 questions	4 Questions x 3 Marks = 12 Marks
Part D	**Long Essay**	**4 Questions x 5 Marks = 20 Marks**
	Answer any 2 questions	2 Questions x 5 Marks = 10 Marks
Total Marks Including Choice: 60		
Maximum Marks for the Course: 40		

CONTINUOUS EVALUATION FOR PRACTICAL

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1: LAB SKILLS, OBSERVATION NOTE AND PUNCTUALITY	20% FOR LAB SKILL 20% FOR OBSERVATION NOTE AND PUNCTUALITY	OBSERVATION NOTE IS MANDATORY. MARKS SHOULD BE GIVEN CONSIDERING OBSERVATION NOTE LAB SKILLS AND PUNCTUALITY.
COMPONENT1: TEST	60%	MODEL EXAMINATION SHOULD BE CONDUCTED BEFORE EXTERNAL EXAM AND CONSIDERED FOR INTERNAL MARK

END SEMESTER EVALUATION FOR PRACTICAL

***EXCEPT : 2B04BCA PROGRAMMING IN C- LAB**

COMPONENT	PART A	PART B
Code Writing	3	3
Output	3	3
Modification for Part A or Part B	3	
Record	2	
Viva	3	
Total Marks	**20**	

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Part B	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Total Marks Including Choice: 40		
Maximum Marks for the Course: 20		

SEMINARS/ASSIGNMENTS/VIVA

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

RECORDS

One rough record (Observation Note) and one fair record are compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works. Record mark is calculated at the time of End Semester Evaluation. Observation notes are compulsory in Lab hours.Students should get signature for each program done in the lab from the faculties and those programs are recommended for fair record.

PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of FIVE credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but, in an instance, where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to THREE.

PROJECT EVALUATION

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. Assessment of different components may be taken as below.

CONTINUOUS EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Punctuality	20%
Relevance of topic System study / Design of tables	20%
Project Report	30%
Presentation & Viva-voce	30%
Total	**100%**

END SEMESTEREVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Written Synopsis/Abstract	12.5%
Content of the Project	12.5%
Quality of project work/Useof software/ tools	12.5%
Perfection of the work (Designs of tables/ Input & Output forms)	25%
Live demo	12.5%
Viva-voce	25%
Total	**100%**

KANNUR UNIVERSITY

(Abstract)

B.Sc. Computer Science Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/12371/2019

Civil Station P.O, Dated 21/06/2019

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3. U.O No.Acad.C2/429/2017 Vol.II dated 03-06-2019
4. The Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 07-06-2019
5. Syllabus of B.Sc. Computer Science submitted by the Chairperson, Board of Studies in Computer Science (UG) dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies, Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Computer Science (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc.Computer Science Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Computer Science (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc Computer Science Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc. Computer Science programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to report before the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.Sc.Computer Science Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
for REGISTRAR

To

The Principals of Colleges offering B.Sc. Computer Science Programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Computer Science (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES-COMPUTER SCIENCE(UG)

SYLLABUS FOR B.SC. COMPUTER SCIENCE CORE, COMPLEMENTARY ELECTIVE COURSE FOR B.SC. MATHEMATICS/STATISTICS/PHYSICS/ ELECTRONICS PROGRAMMES AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM
(OBE-Outcome Based Education System)

(2019 ADMISSION ONWARDS)

Kannur University

Vision and Mission Statement

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manantavadytaluk of Wayanad Revenue District"

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

Programme Outcomes (PO)

PO 1. Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2. Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3. Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Technological innovations have redefined the traditional concepts of education, profession and lifestyles in the contemporary scenario. Computer Systems are a part of every aspect of prevalent culture from home video game consoles to hospital monitoring equipment. Computer scientists design, build and improve these systems, finding new applications for sophisticated technology. India has been one of the leading exporters of IT talent and Indian computer professionals have played major role in the growth and development of IT sector in various countries.

The Board of Studies in Computer Science travails to offer students with a solid technological foundation through the reformed curriculum for undergraduate programme of Kannur University. The curriculum aims at developing technical caliber among students through academic explorations in the classroom, extended academic activities like seminars, workshops and conferences. Formative and summative assessments will absolutely be in tune with the learning outcomes and the instructional strategies.

In this era of unprecedented technological developments, the Board of Studies in Computer Science of Kannur University substantially emphasizes employment-based curriculum to empower the students with refined technical competence. This curriculum categorically states the graduate attributes / outcomes and has been developed after various workshops and academic deliberations with different stakeholders at various levels. The Board of Studies in Computer Science has resolved to introduce the syllabus for UG Programme in the affiliated colleges from 2019 admission onwards and I would like to place on record my gratefulness to the members of the Board of Studies, faculty and stakeholders for having helped me in the formulation of this syllabus.

Lt. Thomas Scaria

Chairperson

Board of Studies, Computer Science (UG)
Kannur University

KANNUR UNIVERSITY

Programme Specific Outcome of B.Sc. Computer Science Programme

PSO1	Understand the concepts of Computer Science and Applications.
PSO2	Understand the concepts of System Software and Application Software.
PSO3	Understand the concepts of Algorithms and Programming.
PSO4	Understand the concepts of Computer Networks and Operating Systems
PSO5	Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering.

KANNUR UNIVERSITY

BSC COMPUTER SCIENCE PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common Course – English I	4	5	18	25
	Common Course – English II	3	4		
	Common Course – Additional Language I	4	5		
	Core Course I – 1B01CSC Introduction to C Programming	2	1		
	Core Course III – 2B03CSC Lab 1: C Programming*	0	2		
	Complementary Elective I (Mathematics /Statistics)	3	4		
	Complementary Elective II (Physics)	2	2		
	Complementary Elective II (Physics- Practical)	-	2		
II	Common Course – English III	4	5	20	25
	Common Course – English IV	3	4		
	Common Course – Additional Language II	4	5		
	Core Course II – 2B02CSC Advanced C Programming	2	1		
	Core Course III – 2B03CSC Lab 1: C Programming*	2	2		
	Complementary Elective I (Mathematics /Statistics)	3	4		
	Complementary Elective II (Physics)	2	2		
	Complementary Elective II (Physics- Practical)	-	2		
III	General Awareness Course I – 3A11CSC Programming in C++	3	3	15	25
	General Awareness Course II – 3A12CSC Database Management System	3	3		
	Core Course IV – 3B04CSC Data Structures	4	4		
	Core Course VI – 4B06CSC Lab II: Data Structures Using C++**	0	3		
	Core Course VII – 4B07CSC Lab III: Database Management System**	0	2		
	Complementary Elective I (Mathematics /Statistics)	3	5		
	Complementary Elective II (Physics)	2	3		
	Complementary Elective II (Physics- Practical)	-	2		

IV	General Awareness Course III – 4A13CSC Digital Electronics	3	3	24	25
	General Awareness Course IV – 4A14CSC Operating Systems	3	3		
	Core Course V – 4B05CSC Software Engineering	4	4		
	Core Course VI – 4B06CSC Lab II: Data Structures Using C++**	3	3		
	Core Course VII – 4B07CSC Lab III: Database Management System**	2	2		
	Complementary Elective I (Mathematics /Statistics)	3	5		
	Complementary Elective II (Physics)	2	3		
	Complementary Elective II (Physics- Practical)	4	2		
V	Core Course VIII – 5B08CSC Web Technology	4	4	17	25
	Core Course IX – 5B09CSC Java Programming	4	4		
	Core Course X – 5B10CSC Computation Using Python	3	3		
	Core Course XI – 5B11CSC- Discipline Specific Elective I	4	4		
	Core Course XVI – 6B16CSC Lab IV: Java Programming***	0	4		
	Core Course XVII – 6B17CSC Lab V: Web Technology and Python Programming***	0	4		
	General Elective Course	2	2		
VI	Core Course XII – 6B12CSC Computer Networks	4	4	26	25
	Core Course XIII – 6B13CSC Compiler Design	4	4		
	Core Course XIV – 6B14CSC Computer Organization	3	3		
	Core Course XV – 6B15CSC- Discipline Specific Elective II	4	4		
	Core Course XVI – 6B16CSC Lab IV: Java Programming***	3	2		
	Core Course XVII – 6B17CSC Lab V: Web Technology and Python Programming***	3	2		
	Core Course XVIII – 6B18CSC Project	5	6		
Total				120	150

Total Marks of the Programme – 1750 Marks (Eng-200 Marks, Additional Common Course 100 Marks, Core 1050 Marks, First Complementary Elective 200 Marks and Second Complementary Elective -200 Marks)

*External examination will be conducted at the end of second semester

**External examination will be conducted at the end of fourth semester

***External examination will be conducted at the end of sixth semester

First Complementary Elective: Mathematics/Statistics

Second Complementary Elective: Physics

PART A

B.SC. COMPUTER SCIENCE CORE COURSES WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS(INTERNAL + EXTERNAL)
1B01CSC	INTRODUCTION TO C PROGRAMMING	1	1	2	3	10+40
2B03CSC	LAB I: C PROGRAMMING	1	2	0	-	-
2B02CSC	ADVANCED C PROGRAMMING	2	1	2	3	10+40
2B03CSC	LAB I: C PROGRAMMING	2	2	2	3	5+20
3A11CSC	PROGRAMMING IN C++	3	3	3	3	10+40
3A12CSC	DATABASE MANAGEMENT SYSTEM	3	3	3	3	10+40
3B04CSC	DATA STRUCTURES	3	4	4	3	10+40
4B06CSC	LAB II: DATA STRUCTURES USING C++	3	3	0	-	-
4B07CSC	LAB III: DATABASE MANAGEMENT SYSTEM	3	2	0	-	-
4A13CSC	DIGITAL ELECTRONICS	4	3	3	3	10+40
4A14CSC	OPERATING SYSTEMS	4	3	3	3	10+40
4B05CSC	SOFTWARE ENGINEERING	4	4	4	3	10+40
4B06CSC	LAB II: DATA STRUCTURES USING C++	4	3	3	3	5+20
4B07CSC	LAB III: DATABASE MANAGEMENT SYSTEM	4	2	2	3	5+20
5B08CSC	WEB TECHNOLOGY	5	4	4	3	10+40
5B09CSC	JAVA PROGRAMMING	5	4	4	3	10+40
5B10CSC	COMPUTATION USING PYTHON	5	3	3	3	10+40
5B11CSC	DISCIPLINE SPECIFIC ELECTIVE I	5	4	4	3	10+40
5D--CSC	GENERIC ELECTIVE COURSE	5	2	2	2	5+20
6B16CSC	LAB IV: JAVA PROGRAMMING	5	4	0	-	-
6B17CSC	LAB V: WEB TECHNOLOGY& PYTHON PROGRAMMING	5	4	0	-	-
6B12CSC	DATA COMMUNICATION AND COMPUTER NETWORKING	6	4	4	3	10+40

6B13CSC	COMPILER DESIGN	6	4	4	3	10+40
6B14CSC	COMPUTER ORGANIZATION	6	3	3	3	10+40
6B15CSC	DISCIPLINE SPECIFIC ELECTIVE II	6	4	4	3	10+40
6B16CSC	LAB IV: JAVA PROGRAMMING	6	2	3	3	5+20
6B17CSC	LAB V: WEB TECHNOLOGY& PYTHON PROGRAMMING	6	2	3	3	5+20
6B18CSC	PROJECT*	6	6	5	-	20+80
*AN INDUSTRIAL VISIT (STUDY TOUR) IS RECOMMENDED FOR THE PROJECT WORK						

TOTAL MARKS OF CORE COURSES 1050

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B11CSC-A	ALGORITHM DESIGNING	5	4	4	3
5B11CSC-B	LINUX ADMINISTRATION	5	4	4	3
5B11CSC-C	COMPUTER GRAPHICS	5	4	4;	3
6B15CSC-A	INFORMATION SECURITY	6	4	4	3
6B15CSC-B	DATA MINING	6	4	4	3
6B15CSC-C	BIO-INFORMATICS	6	4	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS EVALUATION FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	80%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE MARKS OBTAINED IN THE TESTS CONDUCTED.

COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	20%	ANY ONE COMPONENT

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**Short Answer**	**6 Questions x 1 Mark = 6 Marks**
	Answer all questions	6 Questions x 1 Mark = 6 Marks
Part B	**Short Essay**	**8 Questions x 2 Marks = 16 Marks**
	Answer any 6 questions	6 Questions x 2 Marks = 12 Marks
Part C	**Essay**	**6 Questions x 3 Marks = 18 Marks**
	Answer any 4 questions	4 Questions x 3 Marks = 12 Marks
Part D	**Long Essay**	**4 Questions x 5 Marks = 20 Marks**
	Answer any 2 questions	2 Questions x 5 Marks = 10 Marks
Total Marks Including Choice: 60		
Maximum Marks for the Course: 40		

CONTINUOUS EVALUATION FOR PRACTICAL

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1: LAB SKILLS, OBSERVATION NOTE AND PUNCTUALITY	20% FOR LAB SKILL 20% FOR OBSERVATION NOTE AND PUNCTUALITY	OBSERVATION NOTE IS MANDATORY. MARKS SHOULD BE GIVEN CONSIDERING OBSERVATION NOTE LAB SKILLS AND PUNCTUALITY.
COMPONENT1: TEST	60%	MODEL EXAMINATION SHOULD BE CONDUCTED BEFORE EXTERNAL EXAM AND CONSIDERED FOR INTERNAL MARK

END SEMESTER EVALUATION FOR PRACTICAL

***EXCEPT : 2B03CSC ADVANCED C PROGRAMMING - LAB**

COMPONENT	PART A	PART B
Code Writing	3	3
Output	3	3
Modification for Part A or Part B	3	
Record	2	
Viva	3	
Total Marks	**20**	

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION-PRACTICAL

Part A	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Part B	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Total Marks Including Choice: 40		
Maximum Marks for the Course: 20		

SEMINARS/ASSIGNMENTS/VIVA

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

RECORDS

One rough record (Observation Note) and one fair record are compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works. Record mark is calculated at the time of End Semester Evaluation. Observation notes are compulsory in Lab hours. Students should get signature for each program done in the lab from the faculties and those programs are recommended for fair record.

PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of FIVE credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but, in an instance, where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to THREE.

PROJECT EVALUATION

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. Assessment of different components may be taken as below.

CONTINUOUS EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Punctuality	20%
Relevance of topic System study / Design of tables	20%
Project Report	30%
Presentation & Viva-voce	30%
Total	**100%**

END SEMESTER EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Written Synopsis/Abstract	12.5%
Content of the Project	12.5%
Quality of project work/Use of software/ tools	12.5%
Perfection of the work (Designs of tables/ Input & Output forms)	25%
Live demo	12.5%
Viva-voce	25%
Total	**100%**

KANNUR UNIVERSITY
(Abstract)

B.A. Economics/ Development Economics Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12530/2019 Dated, Civil Station P.O., 20 .06. 2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated,10-10-2017

2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.

3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.

4. The Minutes of the Meeting of the Board of Studies in Economics (UG) held on 07.06.2019

5. Letter and Syllabus of B.A. Economics/ Development Economics Programme , Submitted by the Chairperson, Board of Studies in, Economics (UG) dated , 15.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies ,Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Economics (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.A.Economics/ Development Economics Programmes to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Economics (UG) submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.A. Economics/ Development Economics Programmes for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper (Core/Complementary Elective/Generic Elective Course) of B.A Economics/ Development Economics programmes under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.A Economics/ Development Economics Programmes are uploaded in the University website. (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-

DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering B.AEconomics/ Development Economics Programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Economics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, ECONOMICS (UG)

SYLLABUS FOR B A PROGRAMME IN ECONOMICS/DEVELOPMENT ECONOMICS CORE, COMPLEMENTARY ELECTIVE COURSE AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

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- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
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- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY
PROGRAMME OUTCOMES (PO)

PO1. Critical Thinking

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO2. Effective Citizenship

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO3. Effective Communication

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO4. Inter disciplinarity

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Economic science has become one of the most dynamic and complex disciplines across natural, physical and social sciences. Its scientific as well as dynamic character has strengthened not only the scope of economics but positively contributed to other streams of knowledge as well. The new BA syllabi of Kannur University have greater scope for using mathematical and statistical techniques, apart from theory and policy. Further it has become more interdisciplinary or/ and multidisciplinary in terms of methods of enquiry and modes of analysis. In the revised syllabi we have incorporated new frontiers of economics such as gender economics, economic geography, economic history, heterodox economics, econometrics and mathematical economics. These interdisciplinary /multidisciplinary areas will strengthen the integrated knowledge profile of the students. Restructuring was done under the initiative of Kannur University and the active involvement of the Members of the Board of Studies in Economics (UG) through a series of deliberations and discussions. In order to make it more participatory and democratic, we have organized a two day workshop to finalize the restructured curriculum and the outcome based syllabi for the BA Economics Programme. Undergraduate economics teachers of all colleges affiliated to Kannur University have actively participated in the workshop and made significant contributions towards the Outcome Based Under Graduate Education. Apart from teachers of affiliated colleges, faculty members of national repute have been invited as resource persons to streamline the syllabi in terms of method, content, and integrity of its epistemology. The basic objective of the revised syllabi is to equip our undergraduates to face the academic and real life challenges in the fast changing world tuned by knowledge revolution, science, technology, research and development. We believe that the revised curriculum and syllabi may open new horizons of knowledge and meet the vision and mission of higher education in the country. It is our privilege to introduce the revised curriculum and syllabi before the fresh undergraduates who are getting enrolled in June 2019 onwards and other stake holders of Economics Undergraduate Education.

Dr. A. Ashokan
Chairperson
Board of Studies, Economics (UG)
Kannur University

Kannur University
Programme Specific Outcome of B.A Economics / Development Economics Programme

The revised curriculum and syllabi of BA Economics Programme of Kannur University provide a structure of core courses, complementary elective courses and generic elective courses. Diversified course structure will contribute towards all round development of the student. The undergraduate programme in economics borrows ideas and techniques from a variety of other disciplines including history, geography, mathematics, statistics, management and environmental science. An undergraduate programme with sound footing in economic theory and empirics would equip the students to a range of career options in the field of economics, finance, commerce, entrepreneurship and management. The specific outcomes of the programme are summarized below:

1. The programme with structured curricula will support the academic development of the undergraduates.
2. The programme will provide the students with the opportunity to pursue courses that emphasize quantitative, qualitative and theoretical aspects of economics.
3. The programme will provide a well resourced teaching learning environment for the students of economics, which will definitely lead to the ultimate educational goal of "learning to be".
4. The programme will promote academic writing, critical thinking and research aptitude among the students.
5. Needless to point out, the students will gain a source of livelihood by expanding their skill set and widening their knowledge horizon.

INDEX

KANNUR UNIVERSITY
B A ECONOMICS PROGRAMME
WORK AND CREDIT DISTRIBUTION STATEMENT

(BA: Common English: 22, Additional Common: 16, Core: 64,
First Complementary Elective: 8, Second Complementary Elective: 8, Generic Elective: 2)

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	**Common English I**	**4**	**5**	**20**	**25**
	Common English II	**3**	**4**		
	Additional Common I	**4**	**4**		
	Microeconomic Analysis I	**5**	**6**		
	Complementary I	**4**	**6**		
II	**Common English III**	**4**	**5**	**19**	**25**
	Common English IV	**3**	**4**		
	Additional Common II	**4**	**4**		
	Microeconomic Analysis II	**4**	**6**		
	Complementary II	**4**	**6**		
III	**Common English V**	**4**	**5**	**21**	**25**
	Additional Common III	**4**	**5**		
	Central Themes in Indian Economy	**5**	**5**		
	International Economics	**4**	**4**		
	Complementary III	**4**	**6**		
IV	**Common English VI**	**4**	**5**	**20**	**25**
	Additional Common IV	**4**	**5**		
	Research Methods and Techniques for Economic Analysis	**4**	**5**		
	Environmental Economics	**4**	**4**		
	Complementary IV	**4**	**6**		
V	**Generic Elective Course**	**2**	**2**	**22**	**25**
	Basic Tools for Economic Analysis I	**4**	**6**		
	Heterodox Economics	**4**	**4**		
	Macroeconomic Analysis I	**4**	**5**		
	Development Economics	**4**	**4**		
	Economics of Banking and Finance	**4**	**4**		
VI	**Basic Tools for Economic Analysis II**	**4**	**6**	**18**	**25**
	Macroeconomic Analysis II	**4**	**5**		
	Public Economics	**4**	**5**		
	Basic Econometric Analysis	**4**	**6**		
	Project	**2**	**3**		
Total				**120**	**150**
Total Marks for Economics Programme 1525					

PART A:

ECONOMICS CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTR	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS (EXT+INT)
1 B 01ECO	MICRO-ECONOMIC ANALYSIS I	I	6	5	3	40+10=50
2 B 02 ECO	MICRO-ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3 B03 ECO	CENTRAL THEMES IN INDIAN ECONOMY	III	5	5	3	40+10=50
3 B04 ECO	INTERNATIONAL ECONOMICS	III	4	4	3	40+10=50
4 B05 ECO	RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS	IV	5	4	2+1*	30+10+10* =50
4B06 ECO	ENVIRONMENTAL ECONOMICS	IV	4	4	3	40+10=50
5D 01ECO	GENERIC ELECTIVE	V	2	2	2	20+5=25
5 B07 ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS I	V	6	4	3	40+10=50
5 B08 ECO	HETERODOX ECONOMICS	V	4	4	3	40+10=50
5 B 09ECO	MACROECONOMIC ANALYSIS I	V	5	4	3	40+10=50
5 B10 ECO	DEVELOPEMNT ECONOMICS	V	4	4	3	40+10=50
5 B11ECO	ECONOMICS OF BANKING AND FINANCE	V	4	4	3	40+10=50
6 B12 ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS II	VI	6	4	3	40+10=50
6 B13 ECO	MACROECONOMIC ANALYSIS II	VI	5	4	3	40+10=50
6 B14 ECO	PUBLIC ECONOMICS	VI	5	4	3	40+10=50
6 B15 ECO	BASIC ECONOMETRIC ANALYSIS	VI	6	4	3	40+10=50
6 B16 ECO	PROJECT**	VI	3	2	PROJECT EVALUATION	**25+25=50
	TOTAL			66		825

*Computer practical

** 25 marks each for Internal and External evaluation

PART A:

DEVELOPMENT ECONOMICS CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS
1 B 01 DEV ECO	MICRO-ECONOMIC ANALYSIS I	I	6	5	3	40+10=50
2 B 02 DEV ECO	MICRO-ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3 B03 DEV ECO	THEORIES OF ECONOMIC DEVELOPEMNT	III	5	5	3	40+10=50
3 B04 DEVECO	INTERNATIONAL ECONOMICS	III	4	4	3	40+10=50
4 B05 DEVECO	RESEARCH METHODS AND TECHNIQUES FOR ECONOMICS ANALYSIS	IV	5	4	2+1*	30+10+10*=50
4B06 DEVECO	ENVIRONMENTAL ECONOMICS	IV	4	4	3	40+10=50
5D 01 DEV ECO	GENERIC ELECTIVE	V	2	2	2	20+5=25
5 B07 DEV ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS I	V	6	4	3	40+10=50
5 B08 DEV ECO	HETERODOX ECONOMICS	V	4	4	3	40+10=50
5 B 09 DEVECO	MACROECONOMIC ANALYSIS I	V	5	4	3	40+10=50
5 B10 DEV ECO	DEVELOPMENT PLANNING: TOOLS AND TECHNIQUES	V	4	4	3	40+10=50
5 B11 DEV ECO	ECONOMICS OF BANKING AND FINANCE	V	4	4	3	40+10=50
6 B12 DEV ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS II	VI	6	4	3	40+10=50
6 B13 DEV ECO	MACROECONOMIC ANALYSIS II	VI	5	4	3	40+10=50
6 B14 DEV ECO	PUBLIC ECONOMICS	VI	5	4	3	40+10=50
6 B15 DEV ECO	BASIC ECONOMETRIC ANALYSIS	VI	6	4	3	40+10=50
6 B16 DEV ECO (PROJECT)	PROJECT**	VI	3	2	PROJECT EVALU-ATION	**25+25=50
	TOTAL			66		825

*Computer practical

** 25 marks each for Internal and External evaluation

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT1 EXAM	50%	
COMPONENT 2 ASSIGNMENT/ SEMINAR	50%	

*Any two components, Attendance shall not be a component

PART A:
ECONOMICS/DEVELOPMENT ECONOMICS:
COMPLEMENTARY ELECTIVE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

SL NO.	COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS
1	1 C 01ECO/ DEV ECO	MATHEMATICS FOR ECONOMIC ANALYSIS I	I	6	4	3	40+10=50
2	2 C 02 ECO/ DEV ECO	MATHEMATICS FOR ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3	3 C03 ECO/ DEV ECO	MATHEMATICAL ECONOMCIS I	III	6	4	3	40+10=50
4	4 C04 ECO/ DEV ECO	MATHEMATICAL ECONOMCIS II	IV	6	4	3	40+10=50
5	1 C05 ECO	INTRODUCTORY ECONOMICS I (FOR NON-ECONOMICS PROGRAMMES ONLY)	I	6	4	3	40+10=50
6	2 C06 ECO	INTRODUCTORY ECONOMICS II (FOR NON-ECONOMICS PROGRAMMES ONLY)	II	6	4	3	40+10=50
7	3 C07 ECO	HISTORY OF ECONOMIC THOUGHT I	III	6	4	3	40+10=50
8	4 C08 ECO	HISTORYOF ECONOMIC THOUGHT II	IV	6	4	3	40+10=50
9	1 C 09ECO	POPULATION AND DEVELOPEMNT	I	6	4	3	40+10=50
10	2 C10 ECO	ECONOMIC GEOGRAPHY	II	6	4	3	40+10=50
11	3 C11ECO	AGRICULTURAL ECONOMICS	III	6	4	3	40+10=50
12	4 C12 ECO	GENDER ECONOMICS	IV	6	4	3	40+10=50

ECONOMICS/DEVELOPMENT ECONOMICS:
LIST OF GENERIC ELECTIVE COURSES (ANY ONE OUT OF FIVE)
WORK AND CREDIT DISTRIBUTION

COURSE CODE	**COURSE TITLE**	**SEMESTER**	**HOURS/ WEEK**	**CREDIT**	**EXAM HOURS**	**MARKS (EXT+INT)**
5 D 01 ECO/ DEV ECO	BASICS OF ECONOMICS	**V**	2	2	2	20+5=25
5 D 02 ECO/ DEV ECO	DEVELOPMENT ISSUES OF INDIAN ECONOMY	**V**	2	2	2	20+5=25
5 D 03 ECO/ DEV ECO	KERELA ECONOMY	**V**	2	2	2	20+5=25
5 D 04 ECO/ DEV ECO	FUNDAMENTALS OF BUDGET	**V**	2	2	2	20+5=25
5 D 05 ECO/ DEV ECO	INDIAN ECONOMY IN THE POST-REFORM PERIOD	**V**	2	2	2	20+5=25

KANNUR UNIVERSITY

(Abstract)

M A Programme in English Language & Literature Programme under Credit Based Semester System in affiliated colleges – Revised Scheme, Syllabus and Pattern of Question Papers -Implemented with effect from 2016 admission- Orders issued.

ACADEMIC C SECTION

UO.No.Acad/C3/ 13141/2014 Civil Station P.O, Dated,15 -07-2016.

Read : 1. U.O.No.Acad/C1/ 11460/2013, dated, 12-03-2014, 05.12.2015 & 22.02.2016.
2. U.O of even No dated 20.10.2014
3. Meeting of the Board of Studies in English(PG) held on 06-05-2016.
4. Meeting of the Board of Studies in English(PG) held on 17-06-2016.
5. Letter dated 27.06.2016 from the Chairman, Board of Studies in English(PG)

ORDER

1. The Regulations for P.G Programmes under Credit Based Semester System were implemented in the University with effect from 2014 admission vide paper read (1) above dated 12.03.2014 & Certain modifications were effected to the same dated 05.12.2015 & 22.02.2016 respectively.

2. As per paper read (2) above, the Scheme , Syllabus & Pattern of question papers for M A Programme in English Language and Literature under Credit Based Semester System in affiliated Colleges were implemented in the University w.e.f. 2014 admission.

3. The meeting of the Board of Studies in English(PG) held on 06-05-2016 , as per paper read (3) above, decided to revise the syllabus for M A Programme in English Language and Literature w.e.f. 2016 admission & as per paper read (4) above the Board of Studies finalized and recommended the scheme, syllabus and Pattern of question papers for M A Programme in English Language and Literature for implementation with effect from 2016 admission.

4. As per the paper read (5) above, the Chairman, Board of Studies in English (PG) has forwarded the finalized copy of the Scheme , Syllabus & Pattern of question Papers for M A Programme in English Language and Literature for implementation with effect from 2016 admission.

5.The Vice-Chancellor, after considering the matter in detail, and in exercise of the powers of the Academic Council, as per Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised Scheme , Syllabus & Pattern of question Papers for M A Programme in English Language and Literature as recommended by the Board of Studies, under Credit Based Semester System in affiliated colleges with effect from 2016 admission.

P.T.O.

6.Orders are therefore issued, implementing the revised Scheme , Syllabus & Pattern of Question Papers for M A Programme in English Language and Literature under Credit Based Semester System in affiliated Colleges with effect from 2016 admission, subject to report to the Academic Council.

7.The implemented Scheme, Syllabus & Pattern of Question Papers are appended here with.

Sd/-

JOINT REGISTRAR (ACADEMIC)

For Registrar

To:

The Principals of Affiliated Colleges Offering MA English Language and Literature Programme.

Copy to:

1.The Examination Branch
2. The Chairman, Board of Studies in English (PG)
3. PS to VC/PA to PVC/PA to Registrar/PA to CE.
4. JR/AR-I (Academic).
5.The Computer Programmer (with a request to upload the Website)
6. SF/DF/FC

Forwarded /By Order

SECTION OFFICER

- For more details log on to www kannur university.ac.in

APPENDIX TO U.O.NO.ACAD/C3/13141/2014 DATED 15.07.2016

KANNUR UNIVERSITY

M. A. PROGRAMME IN ENGLISH LANGUAGE AND LITERATURE

CREDIT BASED SEMESTER SYSTEM IN AFFILIATED COLLEGES

REVISED SCHEME & SYLLABUS

2016 ADMISSION ONWARDS

M. A. PROGRAMME IN ENGLISH LANGUAGE AND LITERATURE (CCSS)

REVISED SYLLABUS – 2016 ADMISSION ONWARDS

(To be followed in the affiliated colleges under Kannur University)

SEMESTER 1—Four Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
I	ENG 1C01	British Literature: Chaucer to Seventeenth Century	20	80	100	4	5
	ENG 1C02	British Literature: Eighteenth Century	20	80	100	4	5
	ENG 1C03	Literary Criticism	20	80	100	4	5
	ENG 1C04	History and Structure of English Language	20	80	100	4	5
	ENG 1E01 ENG 1E02 ENG 1E03	**Elective** (Choose one among three) Malayalam Literature in Translation Media Studies English Language Teaching	20	80	100	4	5
	TOTAL		**100**	**400**	**500**	**20**	**25**

SEMESTER 2—Three Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
II	ENG 2C05	Literature of the Romantic Period	20	80	100	4	7
	ENG 2C06	Literature of the Victorian Period	20	80	100	4	7
	ENG 2C07	Modern Literary Theory	20	80	100	4	6
	ENG 2E04 ENG 2E05 ENG 2E06	**Elective** (Choose one among three) Translation Studies World Drama Dalit Writings	20	80	100	4	5
	TOTAL		**80**	**320**	**400**	**16**	**25**

SEMESTER 3—Four Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
III	ENG 3C 08	Twentieth Century British Literature	20	80	100	4	6
	ENG 3C09	Linguistics	20	80	100	4	4
	ENG 3C10	Indian Writing in English	20	80	100	4	5
	ENG 3C11	American Literature	20	80	100	4	6
	ENG 3E07 ENG 3E08 ENG 3E09	**Elective** (Choose one among three) Introduction to Cultural Studies European Fiction Introduction to Comparative Literature	20	80	100	4	4
	TOTAL		**100**	**400**	**500**	**20**	**25**

SEMESTER 4—Six Core Courses including Project Work and Viva-voce

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
IV	ENG 4C 12	Postcolonial Writings	20	80	100	4	6
	ENG 4C 13	Women's Writing	20	80	100	4	6
	ENG 4C 14	Film Studies	20	80	100	4	6
	ENG 4C 15	Comprehension	20	80	100	4	4
	ENG PR 16	Project	20	80	100	4	3
	ENG 4C 17	Viva-Voce	00	100	100	4	0
	TOTAL		**100**	**500**	**600**	**24**	**25**

Details of Marks, Credit and Hours

Internal Assessment	380 (Maximum 20 marks for a course. Test Paper: 5 Marks; Assignment: 5 Marks; Seminar/Viva: 5 Marks Attendance: 5 Marks) Comprehension Course Internal (20 marks oral test)
External Evaluation	1620
Total Marks	2000
Total Credits	80
Total Hours	25 per week

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KANNUR UNIVERSITY

(Abstract)

(MCJ) Master of Communication and Journalism Programme - under Credit Based Semester System in Affiliated Colleges - Revised Scheme, Syllabus &Model Question Papers- Implemented with effect from 2016 Admission - Orders issued.

ACADEMIC C SECTION

U.O No. Acad/C1/10822/2014 Civil Station (PO), Dated, 11-07-2016

Read: 1. U.O.No.Acad C1/11460/2013 dtd 12-03-2014
2. U.O.of even No dtd 29-08-2014
3. U.O.No.Acad C1/11460/2013 dated 05-12-2015 & 22-02-2016
4. Minutes of the meeting of the Board of Studies in Journalism & Mass Communication(Cd) held on 25-02-2016
5. U.O. of even No dtd 31-03-2016
6. Letter dated 27- 06- 2016 from the Chairman, Board of Studies in Journalism & Mass Communication(Cd)

ORDER

1. The Regulations for Credit Based Semester System for P.G. Programmes in affiliated Colleges were implemented in the University with effect from 2014 admission vide paper read (1) above and certain modifications were effected to the same vide paper read (3) above.

2. As per the paper read (2) above, the Scheme,Syllabus & Model Question papers for Master of Communication and Journalism (MCJ) Programme were implemented in the University under Credit Based Semester System .w.e.f. 2014 admission.

3. As certain anomalies were reported in the existing MCJ Syllabus implemented w.e.f 2014 admission and since the question paper setting of 2014 admission 3rd Sem and 2015 admission Ist Semester was over, the BOS vide paper read (4) above, decided to follow the existing Syllabus for 2014 & 2015 admission and the above decision of the board was implemented vide paper read (5) above. The Board of Studies also decided to revise the Syllabus w.e.f 2016 admission in the light of decision of the meeting and approved the restructured Syllabus by correcting the anomalies to be implemented w.e.f.2016 admission.

4. The Chairman Board of Studies in Journalism & Mass Communication (Cd) vide paper read (6) above has forwarded the revised Scheme, Syllabus and Model Question paper for Master of Communication and Journalism (MCJ) Programme for implementation with effect from 2016 admission.

5. The Vice Chancellor after considering the matter in detail, and in exercise of the powers of the Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement the revised Scheme ,Syllabus and Model Question papers as recommended by the Board of Studies in Journalism and Mass Communication (Cd) under Credit Based Semester System in affiliated Colleges with effect from 2016 admission, subject to report to the Academic Council.

6.Orders are, therefore, issued accordingly.

7. The revised Scheme, Syllabus and Model Question Papers w.e.f 2016 admission are appended.

Sd/-
JOINT REGISTRAR (ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering MCJ Programmes

Copy to:
1. The Examination Branch (through PA to CE).
2. The Chairman BOS in Mass Communication & Journalism (Cd)
3. SF/DF/FC.

Forwarded /By Order

SECTION OFFICER

For more details; log on www.kannur university .ac.in

KANNUR UNIVERSITY

REVISED SCHEME AND SYLLABUS FOR

PG PROGRAMME IN

Master of Communication and Journalism (MCJ)

UNDER CREDIT BASED SEMESTER SYSTEM

KU CBSS-PG-2014

FOR

AFFILIATED COLLEGES UNDER KANNUR UNIVERSITY

From 2016 ADMISSION onwards

Prepared and offered by: *Board of Studies of Journalism and Mass Communication, Kannur University*

MCJ Programme SYLLABUS for Affiliated Colleges in Kannur University w.e.f 2016

Master of Communication and Journalism

The syllabi of MCJ programme offered in the affiliated colleges of the university under semester system have been revised in the light of the decision of the meeting of the Board of studies, Journalism and Mass Communication held on 25/02/2016. The revised syllabi shall apply to MCJ programmes conducted by the affiliated colleges of Kannur university with effect from the academic year 2016-17 (2016 admission onwards) and regulations of PG Programme of Kannur University (KUCBSS –PG-2014) - U.O. No: Acad/C1/11460/2013 Dated 12/03/2014 and the revised order No.Acad/C1/11460/2013 Dated 05/12/2015 and 22.02.2016 shall be applicable to the MCJ Programme implemented w.e.f. 2016 admission.

I. Programme structure:

I Semester -from June to October

No	**Core / Elective**	**Course Code**	**Title of the Course**	**Hours allotted per week**	**Credits**	**Marks**		
						CA	ESE	Total
1	Core	MCJ 1C 01	Introduction to Mass Communication	06	04	15	60	75
2	Core	MCJ 1C 02	Reporting for Newspapers	06	04	15	60	75
3	Core	MCJ 1C 03	Editing for Newspapers	06	04	15	60	75
4	Core	MCJ 1C 04	Television Production	07	04	15	60	75
Total				25	16	60	240	300

II Semester -from November to March

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 2C 05	Media Laws and Ethics	04	04	15	60	75
2	Core	MCJ 2C 06	Magazine Journalism	04	04	15	60	75
3	Core	M CJ 2C 07	Communication Theories	04	04	15	60	75
4	Core	MCJ 2C 08	Radio Production	04	04	15	60	75
5	Elective**	MCJ 2E 01	Photo Journalism	04	04	15	60	75
6	Elective**	MCJ 2E 02	Travel Journalism					
7	Elective**	MCJ 2E 03	Health Communication					
8	Practical – I	MCJ 2 P 01	Newspaper production , Video production, Magazine production and Radio production	05	02	10 (2.5+2.5+2.5+2.5)	40 (10+10+10+10)	50
Total				25	22	85	340	425

**** Select one elective from this group**

III Semester -from June to October

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 3C 09	Public Relations and Corporate Communication	05	04	15	60	75
2	Core	MCJ 3C 10	Advertising	05	04	15	60	75
3	Core	MCJ 3C 11	Mass communication Research	05	04	15	60	75
4	Core	MCJ 3C 12	Television Journalism	05	04	15	60	75
5	Elective**	MCJ 3E 04	Indian Politics and Communication	05	04	15	60	75
6	Elective**	MCJ 3E 05	Agricultural Journalism					
7	Elective**	MCJ 3E 06	Business Journalism					
8	Elective**	MCJ 3E 07	Development Communication					
Total				25	20	75	300	375

**** Select one elective from this group**

IV Semester- from November to March

No	**Core / Elective**	**Course Code**	**Title of the Course**	**Hours allotted per week**	**Credits**	**Marks**		
						CA	ESE	Total
1	Core	MCJ 4C 13	Introduction to Cinema	05	04	15	60	75
2	Core	MCJ 4C 14	New Media and Online Journalism	05	04	15	60	75
3	Elective**	MCJ 4E 08	Technical Writing	05	04	15	60	75
4	Elective**	MCJ 4E 09	Fashion Communication					
5	Elective**	MCJ 4E 10	Sports Journalism					
6	Practical – **II**	MCJ 4P 02	PSA production, TV News bulletin production and Short film production	05	02	10 (2.5+2.5+5)	40 (10+10+20)	50
7	Project	MCJ 4Pr	Dissertation	05 -	03	10	40	50
			Internship*		02	25	-	25
8	Viva Voce	MCJ 4 C 15	Viva Voce	--	03		50	50
Total				25	22	90	310	400

**** Select one elective from this group**

***Marks for internship should be allotted by the HOD**

a. Total marks for semester – I -300
b. Total marks for semester – II- 425
c. Total marks for semester – III- 375
d. Total marks for semester – IV- 400
e. Total marks for semester I to IV- 1500

II. Practicals

Practical –I

MCJ 2 P 01 Newspaper production, Video production, Magazine production and Radio production.

1. Lab Newspapers: 5 Marks

Each student shall submit five single-page printed A3-size lab-newspapers either in Malayalam or in English, prepared as part of reporting assignments within the semester, to be evaluated by external examiners.

2. Newspaper Front Page: 5 Marks

Each student shall edit and design the front page of an A3-size newspaper either in Malayalam or in English, with the stories given by the external examiners.

3. Video production: 10 Marks

Students, divided into teams of four members each, shall produce a video of their choice without dialogue limited to five minutes, during the semester and submit it for external valuation.

4. Magazine production: 10 Marks

Students shall be divided into teams of five members each, to bring out a printed multi-color 32-page-magazine either in Malayalam or in English, reported, subbed and designed by them during the semester. It shall be submitted for external valuation.

5. Radio production: 10 Marks

Each student shall produce a seven minutes radio feature / documentary on a topic and submit it for external valuation.

Practical –II

MCJ 4P 02 PSA production, TV News bulletin production and Short film production

1. PSA production: 10 Marks

Each student shall produce a Public Service Advertisement (PSA) in print/ audio/ visual format and submit it for external valuation.

2. TV News bulletin production: 10 Marks

Students either in groups of 4-5 or individually shall report, edit and present a news bulletin either in Malayalam or in English and submit it for external valuation. The duration of a solo news bulletin shall be seven minutes while for group productions it will be 25 minutes.

3. Short film production: 20 Marks

Students divided into teams of four or five members each shall produce either a documentary or a short film of 15-minutes, in Malayalam or English, within the semester and submit it for external valuation.

III. Dissertation:

In the fourth semester each student shall submit a dissertation on any topic of his/her interest. The dissertation aims at introducing the students with research methodology and to prepare them for doing further research .Students are required to do a dissertation on a topic relating to an area of study chosen in consultation with the faculty. Each student shall be guided in his/her project by a member of the faculty.

IV. VIVA:

A Viva Voce examination will be conducted at the end of IV semester covering the whole programme including the project.

KANNUR UNIVERSITY

M.Com. Programme under Credit Based Semester System in affiliated Colleges- Revised Scheme, Syllabus &Model Question Papers- Implemented with effect from 2014 admission- Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C1/6898 /2014

Dated, Civil Station. P.O. 8- 7 - 2014

Read : 1. U.O.No.Acad C1/11460/2013 dated 12-03-2014.
2.Minutes of the meeting of the Board of Studies in Commerce (PG) held on 10-12-2013
3.Minutes of the meeting of the Faculty of Commerce and Management Studies held on 28-03-2014
4.Letter dated 3-06-2014 from the Chairman, Board of Studies in Commerce (PG)

ORDER

1. As per the paper read (1) above, the Revised Regulations for P.G. Programmes under Credit Based Semester System (CBSS) have been implemented in this University w.e.f 2014 admission.

2. The Board of Studies in Commerce PG vide paper read (2) above, finalized the Scheme Syllabus and Model Question Papers for M.Com Programme under Credit Based Semester System with effect from 2014 admission.

3. As per the paper read (3) above the meeting of Faculty of Commerce and Management Studies approved the Scheme, Syllabus and Model question papers for M.Com Programme w.e.f.2014 admission.

4. The Chairman , Board of Studies in Commerce (PG) as per letter cited (4) has forwarded the Scheme, Syllabus and Model Question Papers for M.Com Programme for implementation with effect from 2014 admission.

5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement Scheme, Syllabus and Model Question Papers for M.Com Programmes under Credit Based Semester System(CBSS) with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore, issued accordingly.

7. The Implemented Scheme, Syllabus and Model Question Papers are appended.

Sd /-
DEPUTY REGISTRAR(Academic)
FOR REGISTRAR

To

The Principals of Colleges offering M.Com Programme

8/7/14

(PTO)

Copy To:

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8. Chairman,BOS in ~~History~~ Commerce (PG)
9. SF/DF/FC

Approved for Issue

Section Officer

*For more details;log on www.kannur university.ac.in

KANNUR UNIVERSITY

U.O.No.Acad/C1/6898/2014 Dated, 8-07-2014

SYLLABUS FOR THE POST GRADUATE DEGREE PROGRAMME IN COMMERCE
(M.Com) UNDER CREDIT BASED SEMESTER SYSTEM (CBSS-PG) FOR
AFFILIATED COLLEGES IMPLEMENTED WITH EFFECT
FROM 2014-15 ACADEMIC YEAR

Submitted to
THE KANNUR UNIVERSITY

PG BOARD OF STUDIES COMMERCE

COURSES FOR M.COM

Semester	**Course Code**	**Title**	**Marks**			
			Internal	**External**	**Total**	**Credit**
I	COM1C01	Business Environment & Policy	15	60	75	4
	COM1C02	Quantitative Techniques & Operation Research	15	60	75	4
	COM1C03	Management Information System	15	60	75	4
	COM1C04	Organizational Behaviour	15	60	75	4
	COM1C05	Accounting for Business Decisions	15	60	75	4
	Total		75	300	375	20
II	COM2C06	Strategic Management	15	60	75	4
	COM2C07	Research Methodology & Computer Application	15	60	75	4
	COM2C08	Costing for Management Decisions	15	60	75	4
	COM2C09	Advanced Business Accounting	15	60	75	4
	COM2C10	Financial Management	15	60	75	4
	Total		75	300	375	20
III	COM3C11	Marketing Management	15	60	75	4
	COM3C12	Corporate Accounting	15	60	75	4
	COM3C13	Income Tax Law & Practice	15	60	75	4
	COM3C14	Wealth Tax & Indirect Taxes	15	60	75	4
	COM3C15	Human Resource Management	15	60	75	4
	Total		75	300	375	20
Elective A. Finance	COM4E01	Security Analysis & Portfolio Management	15	60	75	4
IV	COM4E02	International Financial Management	15	60	75	4
	COM4E03	Financial Markets & Services	15	60	75	4
	COM4E04	Corporate Tax Planning & Management	15	60	75	4
	COM4Pr	Project Report/Dissertation			25	2
	COM4C16	Viva-Voce			50	2
	Total		60	240	375	20
Grand Total					**1500**	**80**

(Continued in Page-2)

Elective B. Marketing	COM4E05	Consumer Behavior	15	60	75	4
IV	COM4E06	Advertising & Sales Management	15	60	75	4
	COM4E07	Services Marketing	15	60	75	4
	COM4E08	Logistics Management	15	60	75	4

Elective C. International Business	COM4E09	International Business Environment	15	60	75	4
IV	COM4E10	Foreign Trade Management	15	60	75	4
	COM4E11	International Banking	15	60	75	4
	COM4E12	International Marketing	15	60	75	4

KANNUR UNIVERSITY

(Abstract)

M.Sc Computer Science Programme – Scheme, Syllabus and Model Question Papers – Core / Elective Courses under – Credit Based Semester System – Affiliated Colleges - Implemented with effect from 2014 admission - Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C4/12581/2014 Dated: Civil Station P.O, 20-10-2014

Read:- 1. U.O.No.Acad.C1/11460/2013 dated 12-03-2014.
2.Minutes of the meeting of the Board of Studies in Computer Science PG held on 16/07/2014.
3.Minutes of the meeting of the Faculty of Technology held on 01/04/2014.
4.Letter dated 29/09/2014 from Dr. Raju Chairman, Board of Studies in Computer Science (PG)

ORDER

1.Revised Regulations for Credit Based Semester System for PG Programmes in affiliated Colleges have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2.The Board of Studeis in Computer Science (PG) vide paper read (2) above, has finalized the Scheme, Syllabus and Model Question papers for M.Sc Computer Science under Credit Based Semester System with effect from 2014 admission.

3. As per paper read (3) above, the meeting of Faculty of Technology, approved the Scheme, Syllabus and Model Question papers for M.Sc Computer Science with effect from 2014 admission.

4.The Chairman, Board of Studies in Computer Science (PG) vide paper (4) above, has forwarded the Scheme, Syllabus and Model Question papers for M.Sc Computer Science for implementation with effect from 2014 admission.

5.The Vice Chancellor, after considering the matter in detail, and in exercise of the power of the Academic Council, conferred under Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the Scheme, Syllabus and Model Question Papers (Core/Elective Courses) for M.Sc Computer Science Programme in affiliated Colleges Under Credit Based Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore issued accordingly.

7. The implemented Scheme, Syllabus and Model Question Papers are appended.

Sd/-
DEPUTY REGISTRAR (Acad)
For REGISTRAR

To

The Colleges offering M.Sc Computer Science Programme.

Copy to:

1.The Examination Branch Through (PA to CE)
2.The Chairman, Board of Studies in Computer Science (PG)
3.PS to VC/PA to R/PA to CE
4.DR/AR-1 Academic

Forwarded/ by Order

SECTION OFFICER

KANNUR UNIVERSITY

M Sc COMPUTER SCIENCE

(Credit Based Semester System)

Regulations, Curricula, Syllabus and Scheme of Evaluation

(With Effect from 2014 admission)

REGULATIONS

1. **Duration** of the M. Sc. (Computer Science) programme shall be 2 years, divided into 4 semesters. Each semester shall have 90 working days.The maximum period of completion is eight semesters (4 years).

2.Eligibilityfor admission: As announced by the University from time to time.

3. Programme Structure

3.1 **Attendance*:*** The minimum attendance required for each course shall be 75% of the total number of classes conducted for that semester. Those who secure the minimum attendance in a semester alone will be allowed to register for the End Semester Examination. Condonation of shortage of attendance may be granted as per Kannur University PG regulation.

3.2 ***Credits:*** The total minimum credits, required to complete M. Sc. Computer Science programme is 80 in which minimum credits required for core (including practical and project) courses is 60 and for Elective courses is 12.

3.3 **Theory and Practical courses**

The evaluation scheme for each Theory and Practical courses except MCS3C16 Research Methodology shall contain two parts; (a) Continuous Assessment (CA) and (b) End Semester Evaluation (ESE). 20% marks shall be given to CA and the remaining 80 % to ESE. For MCS3C16 Research methodology the evaluation is 100% internal and shall follow the distribution applicable to theory CA.

CONTINUOUS ASSESSMENT (CA)

Theory : The components oftheory evaluation are as follows:

	COMPONENTS	% OF MARKS
i	**Test papers**	**40%**
ii	**Assignment**	**20%**
iii	**Case Study / Seminar / Viva**	**20%**
iv	**Attendance**	**20%**

i. *Test Papers*: There shall be a minimum of two test papers to be conducted for each course. If more than two test papers are conducted, then two best scores shall be taken for the award of IA marks. The dates of test papers shall be announced well in advance and the marks should be displayed in the notice board.

ii. *Assignments:* One or more assignments (including practical assignments) shall be given for each course. The mode of assessment of the assignments shall be decided by the faculty concerned with due approval from the department council and shall be declared at the beginning of the semester. (It is suggested that to the extent possible, give individual assignments and also conduct short viva based on the assignment submitted).

iii. *Case study / Seminar / viva*: The faculty with due approval from the department council shall choose one or more from this category, depending on the nature of subject and the mode of assessment is to be declared at the commencement of the semester. For seminar, topics outside but related to thesyllabus shall be chosen.

iv. *Attendance* :

Attendance	**% of Marks for attendance**
>=90	100
85 to 89	80
80 to 84	60
76 to 79	40
75	20

Practical : The Components of CA for practical courses except Case study I and II are as follows:

	COMPONENTS	**% OF MARKS**
i	Lab Test (Minimum one)	20%
ii	Completion of the list of Lab assignments prescribed by the faculty	20%
iii	Periodical assessment of Lab assignments through execution of programs and viva	40%
iv	Attendance (Mark distribution is same as that of theory)	20%

For Case study I and II :

	COMPONENTS	**% OF MARKS**
i	Periodical viva / short quizzes / short programming assignments to evaluate the basic knowledge/understanding of the tool.	30%
ii	Coding – Logic, Selection of appropriate constructs / features of the Tool, Style etc.	30%
iii	Execution of the case study - output	20%
iv	Viva based on case study	20%

Note :*All the records in respect of Continuous Assessment (CA) must be kept in the department and must be made available for verification by university. The results of the CA shall be displayed on the notice board within 5 working days from the last day of a semester. It should be get signed by the candidates. The marks awarded for various components of the CA shall not be rounded* *off, if it has a decimal part. The total marks of the CA shall be rounded off to the nearest whole number.*

END SEMESTER EVALUATION (ESE):

There shall be double valuation system of answer books. The average of two valuations shall be taken in to account. If there is a variation of more than 10% of the maximum marks, the answer books shall be valued by a third examiner. The final marks to be awarded shall be the average of the nearest two out of three awarded by the examiners. After that there shall be no provision for revaluation

Pattern of questions: Questions shall be set to assess knowledge acquired, standard application of knowledge, application of knowledge in new situations, critical evaluation of knowledge and the ability to synthesize knowledge. Question paper for end semester theory examination shall consist of:

i. Short answer type : 12 questions of which 10 to be answered. 10 x 3 = 30 marks,
ii. Essay type: 5 questions (one either –or question from each module) x 10 marks = 50 marks

End Semester Evaluation in Practical courses shall be conducted and evaluated by two examiners- one internal and one external. Details of scheme of evaluation of ESE practical courses are given along with respective syllabus.

3.4 Project: A project work has to be undertaken by all students. The project can be software development following all or some of the software development lifecycle or an R&D project. The hours allotted for project work may be clustered into a single slot so that students can do their work at a centre or location for a continuous period of time. The Major project work should be carried out in the Department /Institution or in alevel Industry / R & D organization of national repute. Project work shall be carried out under the supervision of a Teacher. If the project is carried out in an Industry / R & D organization outside the campus, then a co-guide shall be selected from the concerned organization. If the project work is of interdisciplinary in nature, a co-guide shall be taken from the other department concerned. Every student should do the Project individually and no grouping is allowed. All the candidates are required to get the approval of their synopsis and the guide before commencement of the project from the Department. A co-guide should be a postgraduate in CS or allied subject or a person of eminence in the area in which student has chosen the project. At the end of the semester the candidate shall submit the Project report (two bound copies and one soft copy) duly approved by the guide and co-guide for End Semester Evaluation. The project report shall be prepared according to the guidelines approved by the University.

Evaluation of Project:

i. A Departmental committee duly constituted by the Head of the Department will review the project periodically.

ii. **Continuous Assessment of project work**: There shall be three internal presentations before the committee (Minimum two members, including the guide). The assessment is based on presentation, interim report and viva voce. The total mark for CA shall be divided among the three presentations in the ratio 20%:30%:50%.Each internal presentation shall be evaluated based on the following components:

Component	% of marks
Understanding of the problem / concepts	25
Adhering to methodology.	20
Quality of presentation and demonstration (Demonstration is optional)	15
Quantum of work / effort	30
Organization and content of mid-term report	10

iii. **End Semester Assessment of Project**: A board of two examiners appointed by the University shall conduct ESE evaluation. The evaluation shall be based on the report, presentation of the work, demonstration of the work (optional) and a detailed viva voce based on the work carried out. A candidate will not be permitted to attend the Project evaluation without duly certified project reports. Also a project will be evaluated only if the candidate attend the ESE presentation and Viva voce on the scheduled date and time. A board shall evaluate a maximum of 10 candidates in a day. The ESE evaluation shall consist of the following components:

Component	% of marks
Understanding of the problem/requirements/ concepts related to the project	15
Adhering to methodology (Software engineering phases or research methodology) and the candidates understanding of the components of methodology	15
Quality of Modeling of the problem and solution/ database design / form design / reports / testing (For research projects - relevance /novelty of the work(s)/ use of data/ proposal of new models /analysis of algorithms/ comparison and analysis of results /findings)	20
Quality of presentation / demonstration	15
Quantum of work / effort - assessed through the content of report, presentation and viva.	25
Organization and content of report	10

iv. A student shall be declared to pass in the Project report course if she/he secures minimum 40 % marks of the aggregate and 40% separately for external.

v. If a candidate fail in the evaluation of Project, he/she has to repeat the project course along with the next batch and undergo both CA and ESE. *Unlike theory/practical courses, the CA mark will not retained.*

vi. There shall be no improvement chance for the marks obtained in the Project course.

3.5 Seminar: Each student shall select a relevant topic, prepare a seminar report and give a presentation (30 to 45 minutes),under the guidance of a faculty member. The evaluation of seminar is 100% internal and components and mode of evaluation shall be formulated by the department council (May include components like content, Presentation, interaction and structure of report).

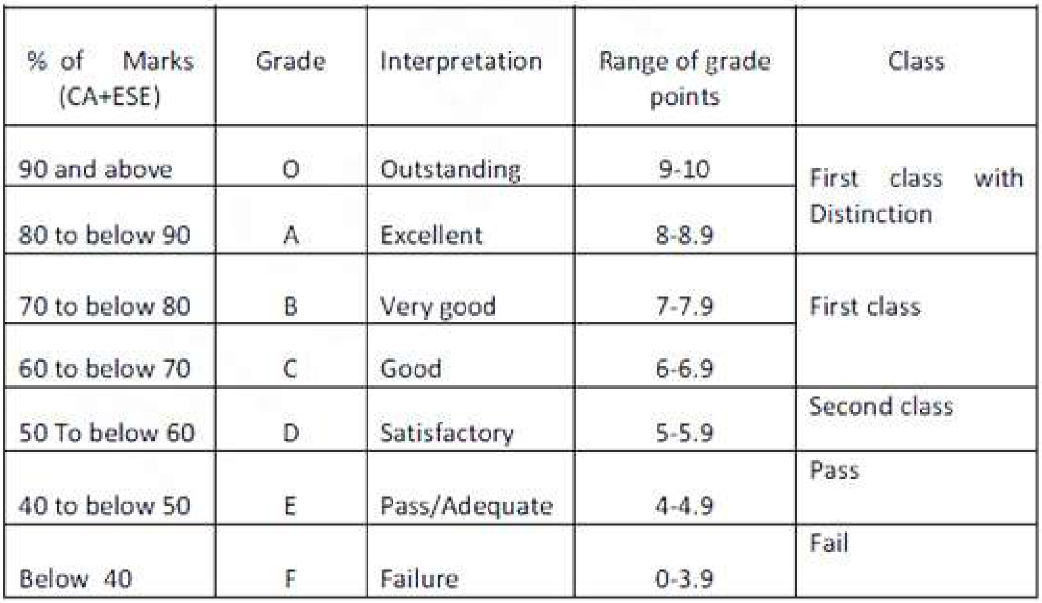
3.6 VIVA VOCE: A general Viva Voce covering all courses in the Programme shall be conducted in the fourth semester. The Viva voce shall be conducted by two external examiners. The Viva voce *shall not be clubbed* with the project evaluation. The details of the mode of conduct and evaluation of Viva Voce shall be decided by the BOE.

4. **GRADING SYSTEM**

Seven Point Indirect Relative grading system:

Evaluation(both internal and external) is carried out using Mark system .The grading on the basis of a total internal and external marks will be indicated for each course and for each semester and for the entire programme.

The guidelines of grading is as follows-



% of Marks (CA+ESE)	Grade	Interpretation	Range of grade points	Class
90 and above	O	Outstanding	9-10	First class with Distinction
80 to below 90	A	Excellent	8-8.9	
70 to below 80	B	Very good	7-7.9	First class
60 to below 70	C	Good	6-6.9	
50 To below 60	D	Satisfactory	5-5.9	Second class
40 to below 50	E	Pass/Adequate	4-4.9	Pass
Below 40	F	Failure	0-3.9	Fail

$$\text{S.G.P.A} = \frac{\text{SUM OF CREDIT POINTS OF ALL COURSES IN THE SEMESTER}}{\text{TOTAL CREDITS IN THAT SEMESTER}}$$

CREDIT POINT = GRADE POINT (G) X CREDIT (C)

$$\text{C.G.P.A} = \frac{\text{Sum of credit points of all completed semesters}}{\text{Total credits acquired}}$$

$$\text{OGPA} = \frac{\textbf{Sum of } \textbf{\textit{credit points}} \textbf{ obtained in four } \textbf{\textit{semesters}}}{\textbf{\textit{Total credits}} \textbf{ (80)}}$$

PASS REQUIREMENT:

COURSE:

A CANDIDATE SECURING E GRADE WITH 40% OF AGGREGATE MARKS AND 40% SEPARATELY FOR ESE FOR EACH COURSE SHALL BE DECLARED TO HAVE PASSED IN THAT COURSE.

SEMESTER

Those who secure not less than 40 % marks (both ESE and CA put together) for all the courses of a semester shall be declared to have successfully completed the semester.

The marks obtained by the candidates for CA in the first appearance shall be retained (irrespective of pass or fail)

The candidates who fail in theory unit shall reappear for theory unit only, and the marks secured by them in practical unit, if passed in practical, will be retained.

A candidate who fails to secure a minimum for a pass in a course will be permitted to write the same examination along with the next batch.

For the successful completion of a semester, a candidate should pass all courses and secure a minimum SGPA of 4. However a student is permitted to move to the next semester irrespective of his/her SGPA. A student will be permitted to secure a minimum SGPA of 4.00 required for the successful completion of a Semester or to improve his results at ESE of any semester, by reappearing for the ESE of any course of the semester concerned, along with the examinations conducted for the subsequent admission

IMPROVEMENT:

A candidate who secures minimum marks (40 %) for a pass in a course will be permitted to write the same examination along with the next batch if he/she desires to improve his/her performance in ESE. If the candidate fails to appear for the improvement examination after registration, or if there is no change/up gradation in the marks after availing the improvement chance, the marks obtained in the first appearance shall be retained. There shall be no improvement chance for the marks obtained in internal assessment. Improvement of a particular semester can be done only once. The student shall avail the improvement chance in the succeeding year along with the subsequent batch.

There will be no supplementary examinations. For re-appearance/ improvement student can appear along with the next batch.

KANNUR UNIVERSITY
M Sc COMPUTER SCIENCE
Course Structure and Scheme of Evaluation (From 2014 Admission)
(CBSS- For affiliated Colleges)

CREDIT DISTRIBUTION

Semester	**Core**	**Elective**	**Practical**	**Project**	**Total**
1	**17**	**0**	**3**	**0**	**20**
2	**16**	**0**	**5**	**0**	**21**
3	**13**	**3**	**5**	**0**	**21**
4	**2**	**9**	**0**	**7**	**18**
Total	**48**	**12**	**13**	**7**	**80**

COURSE STRUCTURE

SEMESTER 1

Course Code	**Course title**	***Instructional Hrs/week***			MARKS			Credit
		L	P	T	CA	ESA	TOTAL	
MCS1C01	Discrete Mathematics	3	0	1	20	80	100	3
MCS1C02	Computer Organization and Architecture	3	0	1	20	80	100	3
MCS1C03	Digital Systems and Microprocessors	4	0	0	20	80	100	4
MCS1C04	Operating Systems	3	0	1	20	80	100	3
MCS1C05	Introduction to Programming	4	0	0	20	80	100	4
MCS1P01	Lab – I (IP/OS)	0	8	2	20	80	100	3
Total		17	8	5	**120**	**480**	**600**	**20**

SEMESTER 2

Course Code	**Course title**	***Instructional Hrs/week***			MARKS			Credit
		L	P	T	CA	ESA	TOTAL	
MCS2C06	Java Programming	3	0	0	20	80	100	3
MCS2C07	Data Structures& Algorithms	3	0	0	20	80	100	3
MCS2C08	Database Management Systems	3	0	0	20	80	100	3
MCS2C09	Computer Networks	3	0	0	20	80	100	3
MCS2C10	Formal Languages and Finite Automata	3	0	0	20	80	100	3
MCS2P02	Lab – II (Java/DS/DBMS)	0	7	1	20	80	100	3
MCS2P03	Case Study I	0	3	2	10	40	50	2
MCS2C11	Seminar	0	0	2	50	0	50	1
Total		15	10	5	**180**	**520**	**700**	**21**

SEMESTER 3

<table>
<tr><th colspan="2" rowspan="2">Course Code</th><th rowspan="2">Course title</th><th colspan="3"><i>Instructional Hrs/week</i></th><th colspan="3">MARKS</th><th rowspan="2">Credit</th></tr>
<tr><th>L</th><th>P</th><th>T</th><th>CA</th><th>ESA</th><th>TOTAL</th></tr>
<tr><td colspan="2">MCS3C12</td><td>Computer Graphics</td><td>3</td><td>0</td><td>0</td><td>20</td><td>80</td><td>100</td><td>3</td></tr>
<tr><td colspan="2">MCS3C13</td><td>System Programming & Compiler Design</td><td>3</td><td>0</td><td>0</td><td>20</td><td>80</td><td>100</td><td>3</td></tr>
<tr><td colspan="2">MCS3C14</td><td>System Administration and Network Programming</td><td>3</td><td>0</td><td>0</td><td>20</td><td>80</td><td>100</td><td>3</td></tr>
<tr><td colspan="2">MCS3C15</td><td>Software Engineering</td><td>3</td><td>0</td><td>0</td><td>20</td><td>80</td><td>100</td><td>3</td></tr>
<tr><td colspan="2">MCS3C16</td><td>Research methodology</td><td>1</td><td>0</td><td>1</td><td>50</td><td>0</td><td>50</td><td>1</td></tr>
<tr><td rowspan="5">ELECTIVE I</td><td>MCS3E01</td><td>Digital Signal Processing</td><td rowspan="5">3</td><td rowspan="5">0</td><td rowspan="5">0</td><td rowspan="5">20</td><td rowspan="5">80</td><td rowspan="5">100</td><td rowspan="5">3</td></tr>
<tr><td>MCS3E02</td><td>Probability and Statistics</td></tr>
<tr><td>MCS3E03</td><td>Fuzzy Systems</td></tr>
<tr><td>MCS3E04</td><td>Design and Analysis of Algorithms</td></tr>
<tr><td>MCS3E05</td><td>Information Security</td></tr>
<tr><td colspan="2">MCS3P04</td><td>Lab – III (CG /NP&A/SP&CD)</td><td>0</td><td>6</td><td>2</td><td>20</td><td>80</td><td>100</td><td>3</td></tr>
<tr><td colspan="2">MCS3P05</td><td>Case study II</td><td>0</td><td>3</td><td>2</td><td>10</td><td>40</td><td>50</td><td>2</td></tr>
<tr><td colspan="3">Total</td><td>16</td><td>9</td><td>5</td><td>180</td><td>520</td><td>700</td><td>21</td></tr>
</table>

SEMESTER 4

Course Code		**Course title**	***Instructional Hrs/week***			MARKS			Credit
			L	P	T	CA	ESA	TOTAL	
ELECTIVE 2	MCS4E06	Digital Image Processing	3	0	0	20	80	100	3
	MCS4E07	Digital Speech Processing							
	MCS4E08	Operations Research							
	MCS4E09	Linux Kernel							
	MCS4E10	Simulation and Modeling							
ELECTIVE 3	MCS4E11	Mobile Computing	3	0	0	20	80	100	3
	MCS4E12	Pattern Recognition							
	MCS4E13	Artificial Neural Networks							
	MCS4E14	High Performance Computing							
	MCS4E15	Visual Cryptography							
ELECTIVE 4	MCS4E16	Linux Device Drivers	3	0	0	20	80	100	3
	MCS4E17	Data Mining							
	MCS4E18	Natural Language Processing							
	MCS4E19	Cyber Forensic							
	MCS4E20	Artificial Intelligence							
MCS3Pr04		Project	0	16	5	20	80	100	7
MCS4C17		General Viva Voce	-	-	-	-	100	100	2
Total			9	16	5	**80**	**420**	**500**	**18**

Dr. DOMINIC THOMAS
Principal
S.E.S. COLLEGE
SREEKANDAPURAM

KANNUR UNIVERSITY

M.Com. Programme under Credit Based Semester System in affiliated Colleges- Revised Scheme, Syllabus &Model Question Papers- Implemented with effect from 2014 admission- Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C1/6898 /2014 Dated, Civil Station. P.O. 8- 7 - 2014

Read : 1. U.O.No.Acad C1/11460/2013 dated 12-03-2014.
2.Minutes of the meeting of the Board of Studies in Commerce (PG) held on 10-12-2013
3.Minutes of the meeting of the Faculty of Commerce and Management Studies held on 28-03-2014
4.Letter dated 3-06-2014 from the Chairman, Board of Studies in Commerce (PG)

ORDER

1. As per the paper read (1) above, the Revised Regulations for P.G. Programmes under Credit Based Semester System (CBSS) have been implemented in this University w.e.f 2014 admission.
2. The Board of Studies in Commerce PG vide paper read (2) above, finalized the Scheme Syllabus and Model Question Papers for M.Com Programme under Credit Based Semester System with effect from 2014 admission.
3. As per the paper read (3) above the meeting of Faculty of Commerce and Management Studies approved the Scheme, Syllabus and Model question papers for M.Com Programme w.e.f.2014 admission.
4. The Chairman , Board of Studies in Commerce (PG) as per letter cited (4) has forwarded the Scheme, Syllabus and Model Question Papers for M.Com Programme for implementation with effect from 2014 admission.
5. The Vice Chancellor after considering the matter in detail and in exercise of the powers of Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement Scheme, Syllabus and Model Question Papers for M.Com Programmes under Credit Based Semester System(CBSS) with effect from 2014 admission subject to report Academic Council.
6. Orders are, therefore, issued accordingly.
7. The Implemented Scheme, Syllabus and Model Question Papers are appended.

Sd /-
DEPUTY REGISTRAR(Academic)
FOR REGISTRAR

To

The Principals of Colleges offering M.Com Programme

8/7/14

(PTO)

Copy To:

1. The Examination Branch (through PA to CE)
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Approved for Issue

Section Officer

*For more details;log on www.kannur university.ac.in

KANNUR UNIVERSITY

U.O.No.Acad/C1/6898/2014 Dated, 8-07-2014

SYLLABUS FOR THE POST GRADUATE DEGREE PROGRAMME IN COMMERCE
(M.Com) UNDER CREDIT BASED SEMESTER SYSTEM (CBSS-PG) FOR
AFFILIATED COLLEGES IMPLEMENTED WITH EFFECT
FROM 2014-15 ACADEMIC YEAR

Submitted to
THE KANNUR UNIVERSITY

PG BOARD OF STUDIES COMMERCE

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	COM3C15	Human Resource Management	15	60	75	4
	Total		75	300	375	20
Elective A. Finance	COM4E01	Security Analysis & Portfolio Management	15	60	75	4
IV	COM4E02	International Financial Management	15	60	75	4
	COM4E03	Financial Markets & Services	15	60	75	4
	COM4E04	Corporate Tax Planning & Management	15	60	75	4
	COM4Pr	Project Report/Dissertation			25	2
	COM4C16	Viva-Voce			50	2
	Total		60	240	375	20
Grand Total					**1500**	**80**

(Continued in Page-2)

Elective B. Marketing	COM4E05	Consumer Behavior	15	60	75	4
IV	COM4E06	Advertising & Sales Management	15	60	75	4
	COM4E07	Services Marketing	15	60	75	4
	COM4E08	Logistics Management	15	60	75	4

Elective C. International Business	COM4E09	International Business Environment	15	60	75	4
IV	COM4E10	Foreign Trade Management	15	60	75	4
	COM4E11	International Banking	15	60	75	4
	COM4E12	International Marketing	15	60	75	4

KANNUR UNIVERSITY

COM1C01 BUSINESS ENVIRONMENT AND POLICY

90 Hours **Credit 04**

Course Objectives:

1. To give the students an exposure to environmental dynamics of contemporary business.
2. To develop the skill of decision making by analyzing the business environment and opportunities.

Module I
Business Environment

Dynamics of Business and its Environment-Structure of Business environment-Types of Environment-Internal Environment -External Environment: Micro and Macro Environment - Changing Dimensions of Business Environment -Environmental Analysis – Benefits and Limitations.

(20 hours)

Module II
Economic Environment

Significance and constituents of Economic environment -Economic Systems and Business -Industrial Policies -Current Industrial Policy -Fiscal Policy Monetary Policy –Foreign Trade Policy -Disinvestment Business Implications –Economic Reforms- Liberalization and Structural Adjustment Programmes -Foreign Direct Investment: Types, Pros & Cons and trends in FDI Government Policy.

(20 hours)

Module III
Regulatory Environment

Elements of the Regulatory Environment - Regulatory Role of the Government -Forms of Regulation -Business Government Interface -Changing Dimensions of Legal Environment in India: IDRA, MRTP Act, FEMA, FT (D&R) Act, Competition Act, and SEBI. Guidelines for Technology Transfer.

(15 hours)

Module IV
Socio-Cultural Environment

Critical elements of Socio Cultural Environment: Social Institutions and Systems- Culture and its influence- Unemployment and Man Power Planning -Emerging Rural Sector in India -Social Responsibility of Business- Social Audit –Relevance of Business Ethics and Corporate Governance

(15 hours)

Module V
Global Environment

Meaning and Nature of Globalization -Impacts –Multi National Corporations -Foreign Collaborations and Indian Business- Non-Resident Indians and Corporate Sector –Global Institutional Framework for Business- GATT/WTO: TRIMS, Agreements on Agriculture and on Textiles and Clothing.

(10 hours)

Practice Hours	(10 hours)
Total Hours	**(90 hours)**

BOOKS FOR REFERENCE:

1. Dr. Vivek Mittal: Business Enviornment; Text & Cases- Excel Books, New Delhi
2. Maheswari and Gupta, A.N. Business, Government and Society.
3. Aswathappa, K. Essentials of Business Enviornment, Himalaya Publishing House, Mumbai.
4. Francis Cherunilam: Business Environment and Policy.
5. Kohli, S. L and Reruthra, N.K. Business Environment
6. Misra & Puri: Business Enviornment
7. K. Chidambaram: Business Enviornment

KANNUR UNIVERSITY

COM1C02 QUANTITATIVE TECHNIQUES AND OPERATION RESEARCH

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To make the students understand some of the basics of quantitative techniques
2. To equip the students to apply operation research techniques for decision making.

COURSE INPUTS:

Module I.
Probability -Meaning and definition -Basic concepts -Addition Theorem and Multiplication Theorem -Bayes' Theorem (Applications Only)
Contact Hours-15

Module II.
Probability Distributions -Introduction -Random variable -Uses of Expected value in decision making, Binomial Distribution -Poisson Distribution -Normal Distribution.
Contact Hours-15

Module III.
Testing of Hypothesis -Introduction -Concepts basic to Hypothesis testing procedure Hypothesis testing for Mean -Difference between means -Hypothesis testing for Proportion Difference between Proportions –Z test-T test -F test.
Contact Hours-10

Module IV.
Operation Research (OR) -Introduction -Uses -Tools in OR -Modeling in OR -Limitations of OR. Contact Hours-10

Module V.
Linear Programming- Basic concepts- uses and applications- Graphic method of solution to the LPP Contact Hours-10

Module VI.
Network analysis -PERT and CPM -Basic concepts -Construction of Network Diagram Calculation of Critical Path -Float -Slacks – (Avoid Crashing of activities and Resource allocation) Contact Hours-20

Practice Hours	10 Hours
Total Hours	**90**

BOOKS FOR REFERENCE:

1. Richard I. Levin, David S. Rubin: Statistics for Management.
2. S. P. Gupta : Statistical Methods.
3. Sharma K. R : Quantitative Techniques and Operation Research.
4. Anand Sharma : Quantitative Techniques for Decision Making.
5. S. D. Sharma: Operation Research.
6. Philip Rajashekaran: Operation Research.
7. Kanti Swarup, Guptha R. K. and Manmohan: Operation Research and Statistical Analysis.
8. C.R. Kothari : Quantitative Techniques
9. S. Kalavathy: Operations Research

KANNUR UNIVERSITY

COM1C03 MANAGEMENT INFORMATION SYSTEM

90 Hours **Credit 04**

COURSE OBJECTIVES:

To provide a basis understanding of the concept of Management Information System, its application in managerial decision making and the process of development and maintenance of information system in an organization.

Module I.
Introduction -Meaning and nature -Elements -Evolution -Functions -Relation with other disciplines -Information Technology and MIS. (10 hours)

Module II.
Concept of Information -Definition -Types -Mathematical definition -Entropy -Redundancy Data Reduction Techniques -Age, Quality and Value of Information -Application of Information concepts to MIS design. (12 hours)

Module III.
System concepts -Definition -Characteristics -General model of system -Types of systems Simplification -Decoupling -Control in systems -Positive and negative feedbacks -Law of requisite variety -Input, Process and Output controls -System concepts applied to MIS design. (13 hours)

Module IV.
Structure of MIS-Multiple approaches to the structure of MIS-Operating elements-Physical components -processing functions -output for users -MIS structure based on the level of management activity -Decision support -Organisational functions -Formal and Informal -Public and Private synthesis of MIS structure. (15 hours)

Module V.
Systems analysis and Design -Development and Implementation -System Development Life Cycle -Prototyping and User development approach. (15 hours)

Module VI.
Data Communication and Networking -Uses and types of Networks -LAN -WAN -MAN Topologies -E-mail -Teleconferencing -Internet Protocols -World Wide Web. Latest Trends in Information Technology (15 hours)

Practice Hours	(10 hours)
Total Hours	**(90 hours)**

BOOKS FOR REFERENCE:

1. Gordon B. Davis : Management Information System : Prentice Hall of India, Delhi.
2. Sadagopan S. : Management Information System : Prentice Hall of India, Delhi.
3. O’Brien James : Management Information System : Tata-McGraw Hill, New Delhi.
4. Murdick, Ross and Clagget : Information System for Modern Management : Prentice Hall, New Delhi.
5. Rajaraman V. : Analysis and Design of Information Systems : Prentice Hall, Delhi.
6. Simkin M.G. : Introduction to Computer Information System for Business : S. Chand & Company, New Delhi.
7. Dr. P. Mohan : Management Information System : Himalaya Publishing House, Delhi.
8. George M. Scott : Management Information System : Tata-McGraw Hill, New Delhi.
9. Effy Oz : Management Information System : Vikas Publishing House, New Delhi. 10.Serm James A : Analysis and Design of Information Systems : McGraw Hills, New York.

KANNUR UNIVERSITY

COM1C04 ORGANISATIONAL BEHAVIOUR

90 Hours **Credit 04**

COURSE OBJECTIVES: The objectives of the course are to help the students.

1. To understand the conceptual framework of management and organizational behaviour.
2. To understand the applicability of the concept.

Module I.

Organizational Behaviour

Concept and significance, relationship between management and organizational behaviour, emergence and ethical perspective, attitudes, perception -learning -personality, Learning theories- classical conditioning- operant conditioning- Cognitive- social learning- Personality theories- Type theory- Trait theory- Psycho analytical theory.

(15 hours)

Module II.

Motivation

Process of motivation -theories of motivation -Need Hierarchy theory -Theory X and Theory Y -Two Factor theory -Alderfer's theory -Mc Cleland's learned need theory -Victor Vroom's expectancy theory -Stacy Adams Equity theory. (20 hours)

Module III.

Group Dynamics and Team Development

Group Dynamics -Definition and Importance -Types of groups -Group formation -Group Development -Group composition -Group performance factors -Principle centered approach to team development. (20 hours)

Module IV.

Organizational Conflicts

Dynamics and Management -Sources -Patterns -Levels and Types of Conflict, Traditional and Modern approaches to conflict: Functional and Dysfunctional Organizational conflicts, Resolution conflict- Transactional analysis.

(10 hours)

Module V.

Organizational Development

Concept -Need for change –Types -Resistance to change -Theories of planned change, Organizational Diagnosis -OD intervention –Benefits and limitations of OD.

(15 hours)

Practice Hours (10 hours)

Total Hours **(90 hours)**

BOOKS FOR REFERENCE:

1. Hersey, Paul, Kenneth H and Derry E. Johnson. Management of Organizational Behaviour, Prentice Hall, New Delhi.
2. Koontz, Harold, Cyril O’ Donnell and Heinz Weihich. Essentials of Management, Tata McGraw Hill, New Delhi.
3. Roffins Stephen P. Organizational Behaviour, Prentice Hall, New Delhi.
4. Sukla Madhukar. Understanding Organization Theory and Practice in India, Prentice Hall, New Delhi.
5. Banarjee M Organizational Behaviour, Allied Publishers Pvt. Ltd. Bombay.
6. Prasad L. M. Organizational Behaviour, Sultan Chand & Co. New Delhi.
7. Agarwall R. D. Organization and Management, Sultan Chand & Co. New Delhi.
8. M.N. Misra: Organizational Behaviour

KANNUR UNIVERSITY

COM1C05 ACCOUNTING FOR BUSINESS DECISIONS

90 Hours **Credit 04**

COURSE OBJECTIVE: To acquaint the students with the tools and techniques for business decisions.

Module I.

Introduction: Management Accounting : Need and Importance -Meaning -Definition -Objectives-Scope. (3 Hours)

Module II.

New Trends in Budgeting : Problems in Traditional Budgeting -Zero Base Budgeting (ZBB) Process -Advantages -Difference between Traditional Budgeting and Zero Base Budgeting Programme Budgeting -Performance Budgeting -Distinction between Programme Budgeting and Performance Budgeting -Participative Budgeting -Responsibility Accounting -Meaning and Definition -Responsibility Centres -Social Accounting -Government accounting and Environment accounting (Only relevant issues related to business decisions).
(25 Hours)

Module III.

Long Term Investment Decisions: Capital Budgeting -meaning -importance -process Evaluation Techniques -Urgency -Payback -ARR -Improvement on traditional approach -Discounted Cash flow Techniques -Net Present Value -Internal Rate of Return -Terminal Value Method -Profitability Index -Capital Rationing. (20 Hours)

Module IV.

Risk Analysis in Capital Budgeting: Relationship between risk and returns -Techniques: Risk Adjusted Discount Rate -Certainty Equivalent Coefficient -Sensitivity Analysis -Probability Assignment -Standard Deviation -Coefficient of Variation -Decision Tree Analysis -Game Theory. (12 Hours)

Module V

Cost of Capital: Meaning -Definition -Assumptions -Importance -Types of cost of capital Theories of cost of capital -Factories determining cost of capital -Methods of computing cost of equity share capital -cost of preference share capital -cost of debt capital -cost of retained earnings -Weighted average cost of capital. (20 Hours)

Hours Practice (10 Hours)
Total Hours (90 Hours)

BOOKS FOR REFERENCE:

1. Anthony Robert : Management Accounting Principles
2. I. M. Pandey : Management Accounting
3. Sharma & Gupta : Management Accounting
4. V. K. Saxena & C.D. Vashits : Advanced Cost & Management Accounting
5. Khan & Jain : Management Accounting
6. S. N. Maheswari : Management Accounting
7. Hingoram N.L. & Ramanathan A.R. : Management Accounting
8. Betty J. : Management Accounting
9. S.K. Battacharya Accounting for Management

KANNUR UNIVERSITY

COM2C06 STRATEGIC MANAGEMENT

90 Hours **Credit 04**

Course Objectives:

1. To give the students an awareness about the importance of strategic management in modern organizations.
2. To give the students an in-depth knowledge in Strategic management process.
3. To develop among the students the skill of managing organizations in the new age.

Module I.

Concepts of Strategic Management : Strategy and Strategic Management -Strategic Decisions Approaches to Strategic Decision Making -Hierarchy of Business Objectives -Levels of Strategies – Strategic Intent -Dimensions of Business Definition -Elements of Strategic Management Process Corporate Governance and Strategic Management.
(10 Hours)

Module II.

Strategy Formulation : Environmental Analysis and Diagnosis -Environmental Sectors Environmental Scanning and Appraisal -ETOP -Organizational Appraisal : Methods and Techniques -SWOT Analysis -Corporate Level Strategies : Expansion, Stability, Retrenchment and Combination Strategies -Business Level Strategies. (15 Hours)

Module III

Strategic Analysis and Choice : Process of Strategic Choice -Strategic Analysis : Tools and Techniques -Corporate Portfolio Analysis -SWOT Analysis -Experience Curve Analysis -Life Cycle Analysis – Industry Analysis -Strategic Group Analysis -Competitor Analysis -Subjective Factors in Strategic Choice -Contingency Strategies -Strategies Plan.
(20 Hours)

Module IV.

Strategy Implementation : Activating Strategies -Nature and Barriers of Implementation -Project Implementation -Procedural Implementation -Resource Allocation -Structural Implementation Structures for Business Strategies and Corporate Strategies -Behavioral Implementation Functional and Operational Implementation -Functional Plans and Policies.
(20 Hours)

Module V

Strategic Evaluation and Control : Nature, Importance, Requirements and Barriers in Effective Evaluation -Strategic Control -Operational Control -Techniques of Strategic Evaluation and Control -Role of Organizational Systems in Evaluation. (15 Hours)

Practice Hours	(10 Hours)
Total Hours	**(90 Hours)**

BOOKS FOR REFERENCE:

1. Strategic Management Theory -Charles W.C. Hill and Gareth R. Jones.
2. Competetive Strategy -Michael E. Porter.
3. Business Policy -Azhar Kazmi
4. Strategic Management -Francis Cherunilam.
5. Strategic Management in Indian Companies -R.A. Sharma.
6. Corporate Strategic Management -R.M. Srivastava.
7. Strategic Management: Analysis-Implementation-Control: Nag A. (Vikas Pub.)

KANNUR UNIVERSITY

COM2C07 RESEARCH METHODOLOGY & COMPUTER APPLICATION

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To make the students understand the steps in the process of Social Research.
2. To equip the students to apply statistical tools for hypothesis test and decision making.

COURSE INPUTS:

Module I

Introduction to Research -Meaning and Definition -Characteristics -Importance -Objectives. Different methods of social research -Historical -Case study -Survey -Experimental -Action research. (Contact Hours 15)

Module II

Research Design -Meaning and objectives -Steps -Components and characteristics -Types of research designs -Descriptive -Diagnostic -Exploratory -Experimental Designs. Identification of Research Problem -Formulating Hypothesis -Meaning and types of Hypothesis.
(Contact Hours 20)

Module III

Data Source and Sampling -Sources of Data -Primary and Secondary sources -Techniques of Primary Data Collection -Questionnaire -Interview schedule -Sample selection -Methods of sampling -Probability and non probability sampling. (Contact Hours 15)

Module IV

Chi Square Test and Analysis of Variance -Chi Square Test -Uses. Analysis of variance One Way and Two Way Classification. Application of Statistical tools for Analysis and testing of significance -Parametric and Non parametric test -ANOVA and F test .
(Contact Hours 10)

Module V

Use of Computers in Research- Practical uses and applications of Statistical Packages in Social Science (SPSS) -Applications by using computer software -MS Excel / Spread Sheet, SPSS, POWER POINT
(Contact Hours 10)

Module VI

Report writing and presentation of findings -Meaning of Research report -Presentation Essential parts of report -Contents -Format -Writing style -Qualities of good research report Model form of Research Report (Contact Hours 10)

Practice Hours	(10 Hours)
Total Hours	**90 Hours**

BOOKS FOR REFERENCE:

1. O.R. Krishnaswami	Research Methodology in Social Sciences.
2. C.R. Kothari	Research Methodology -Methods and Techniques.
3. P. Saravanavel	Research Methodology.
4. S.R. Baja	Methods of Social Survey and Research.
5.R.N. Sharma, R.K. Sharma	Research Methods in Social Science.
6.Dr. S. R. Bajpai	Methods of Social Survey and Research.
7. B.N. Gosh	Research Methodology.
8.Thripathi	Research Methodology in Social Sciences.
9. Deepak Chawla & Neena Sodhi	Research Methodology.
10.A. Leon	Fundementals of Information Technology

KANNUR UNIVERSITY

COM2C08 COSTING FOR MANAGEMENT DECISIONS

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To understand the concept and importance of cost accounting.
2. To understand the application of cost accounting tools for generating information for managerial Decision making.

Module I.

Cost Accounting -Objectives, nature and scope of cost accounting -Cost accounting and managerial decision (10 Hours)

Module II.

Marginal costing and cost volume profit analysis -Decision making -Break even analysis Assumptions -Advantages and limitations -Break even charts -Different types of break even charts -Simple break even chart -Contribution break even chart -Cash break even chart -Control break even chart -Profit volume graphs -Marginal costing and decisions regarding product mix, make or buy decisions and dropping of products. (25 Hours)

Module III.

Differential Cost Analysis -Meaning -Characteristics -Difference between differential cost analysis and marginal costing -Applications and use of differential costing. (15 Hours)

Module IV.

Standard costing as a Control Technique -Setting of Standards and their revision -Variance Analysis -Importance -Kinds of variances and their uses -Material, labour and overhead variances Interpretation of variances -Disposal of variance -Relevance of variance analysis to budgeting and standard costing -Standard costing as a management tool -Limitations of standard costing. (20 Hours)

Module V.

Value Analysis and Cost Reduction -Relevant terms of value -Basic steps in value analysis -Value engineering -cost reduction and cost control -Advantages of cost reduction and cost control -Areas of cost reduction -Techniques of cost reduction. (10 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Costing for Managerial Decisions	Jain & Narang.
2. Management Accounting	S.P. Gupta.
3. Advanced Cost Accounting	Nigam & Sharma.
4. Cost Accounting, Principles and Practice	Lall B.M. & I.C. Jain.
5. Practical Costing	P.C. Tulsian.
6. Advanced cost and Management Accounting	V.K. Saxena & C.D. Vashit.

KANNUR UNIVERSITY

COM2C09 ADVANCED BUSINESS ACCOUNTING

90 Hours **Credit 04**

Course Objectives:

1. To understand new accounting concepts.
2. Expose the students to advanced accounting issues and practices.

Module I.

Valuation of Shares : Valuation of Shares -Need for valuation -Methods of valuation Asset backing -Yield methods. (10 Hours)

Module II.

Accounting Standards : International and Indian Accounting Standards -Importance and need -Arguments for and against Standards -Steps in formulation of Accounting Standards -Accounting Standard Board -Constitution -Indian Accounting Standards. (15 Hours)

Module III.

Accounting for Specialised type of Business : Voyage accounts -Investment accounts Farm accounts. (15 Hours)

Module IV.

Accounting for Price level changes : Methods -CPP and CCA methods. (15 Hours)

Module V.

Human Resources Accounting : Meaning and importance -Methods -Replacement Cost -Opportunity Cost -Historical Cost. (5 Hours)

Module VI.

Government Accounting : General Principles -Special features -Comparison with Commercial Accounting -Public Accounts Committee (10 Hours)

Module VII.

Insurance Claims : Computation of Fire Claims -Loss of Stock -Consequential Loss Policy.

Practice Hours	(10 Hours)
Total Hours	**90 Hours**

BOOKS FOR REFERENCE:

1. Advanced Accounts. - M.C. Shukla and T.S. Grewal
2. Advanced Accountancy - S.P. Jain & K.L. Narang.
3. Advanced Accountancy - R.L. Gupta and M. Radhaswami
4. Advanced Accountancy - S.N. Mahewari
5. Advanced Accountancy - Arulandam & Raman
6. Advanced Financial Accounting - Dr. B.D. Agarwal
7. Financial Accounting - S.N. Maheswari & S.K. Maheswari

KANNUR UNIVERSITY

COM2C10 FINANCIAL MANAGEMENT

90 Hours **Credit 04**

COURSE OBJECTIVES:
Understand the conceptual framework of Financial Management and to equip the students with knowledge about the Financing, Dividend and Liquidity areas of financial decision making in business organizations.

Module I.
Financial management -Meaning and nature -Scope -Traditional vs. Modern concept -Goal of Financial Management -Profit vs Wealth maximization -Finance function -Financial Planning Role of Finance Manager. (10 Hours)

Module II.
Operating and Financial Leverage -Effect on profits -EBIT -EPS analysis -Comparing alternative financial plans -Combined Leverage. (10 Hours)

Module III.
Capital structure -Factors affecting capital structure -Theories of Capital structure -Net Income Approach -Net Operating Income Approach -Traditional Theory -MM Theory. (15 Hours)

Module IV.
Dividend Policy -Theories of dividend policy -Walter’s Model, Gordon’s Model -MM Hypothesis -Aspects of dividend policy -Forms of dividend -Bonus shares -Stability of dividend. (20 Hours)

Module V.
Management of Working Capital -Meaning -Significance -Types -Operating cycle and other methods of estimation of working capital -Financing of working capital -Management of cash and marketable securities Receivables management and credit policy -Inventory management. (25 Hours)

Practice Hours	(10 Hours)
Total Hours	90 Hours

BOOKS FOR REFERENCE:

1. I.M. Pandey: Financial Management: Vikas Publishing House, New Delhi.
2. Prasanna Chandra : Financial Management: Tata Mc Graw Hills, New Delhi.
3. M.Y. Khan & P.K. Jain : Financial Management : Tata Mc Graw Hills, New Delhi.
4.Brealy and Steward : Corporate Finance : Mc Graw Hill, New York.
5. Bhattacharya : Working Capital Management, Strategies and Techniques : Prentice Hall, Delhi.
6. R.K. Sharma & S.K. Guptha : Financial Management.
7. V. K. Bhalla : Financial Management and Policy.
8. S.C. Kuchal : Financial Management.

KANNUR UNIVERSITY

COM3C11 MARKETING MANAGEMENT

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To acquaint the students with the marketing principles and practice.
2. To understand the process of modern marketing.

Module I.

Introduction to marketing: Concept, Nature, Scope and Importance of Marketing -Marketing concepts -Recent trends in marketing -Process of Marketing management -Marketing Management tasks -Strategic Marketing Planning -Marketing Organization in control -Green Marketing, Event Marketing, Interest Marketing and Viral Marketing -Social, Environmental and Ethical issues in marketing -Segmentation, targeting and positioning -Marketing mix.
(20 Hours)

Module II.

Consumer Behaviour : Concept and characteristic -Buyer Behaviour -Consumer decision making process -factors influencing buying behaviour -Consumer value -Consumer satisfaction and consumer delight -Relationship marketing -Consumer protection in India.
(10 Hours)

Module III.

Product decisions -Concept of product -Core product and augmented Product -Product line and mix decisions -Product life cycle -New Product development process -branding and packaging -marketing Myopia. (15 Hours)

Module IV.

Pricing decisions -Factors affecting pricing decisions -pricing policies and strategies Methods of pricing -Price adjustment strategies. (10 Hours)

Module V.

Promotion and Distribution decisions -Marketing communication -Promotion mix-advertising advertising budget -Advertisement copy advertising media -Sales promotion tools and techniques personal selling and salesmanship -Management of Marketing channels -Wholesalers and retailers -new retail formats -Recent trends in Channel Management.
(15 Hours)

Module VI.

Rural Marketing: Features of rural marketing in India -Problems of rural marketing -Rural marketing strategies -Agricultural marketing in India. (10 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Philip Kotler - Marketing Management
2. Sherlekar S.A. - Marketing Management
3. S.P. Bansal - Marketing Management
4. Chabra - Marketing Management
5. Rajan Nair - Marketing Management
6. Arun Kumar & N. Meenakshi - Marketing Management

KANNUR UNIVERSITY

COM3C12 CORPORATE ACCOUNTING

90 Hours **Credit 04**

COURSE OBJECTIVES :
To familiarize the student knowledge about the Corporate Accounting System,

Module I.
Amalgamation, Absorption and Reconstruction of Companies -Meaning -Objectives Amalgamation in the nature of Purchase -Amalgamation in the nature of Merger -Inter Company Owings -Unrealized profit -Inter Company Holdings -Internal Reconstruction -Reduction of capital -Steps for reconstruction (15 Hours)

Module II.
Liquidation of Companies -Meaning -Methods of winding up -Statement of Affairs -Deficiency / Surplus Accounts – Liquidator's Final Statement of Accounts -Receivers Statement of Accounts. (15 Hours)

Module III.
Double Account System -Meaning -Double Account System Vs Double Entry System Advantages and Disadvantages (15 Hours)

Module IV.
Holding Company -Concept and Definition -Principles of consolidation -Contingent liabilities - Unrealised profits -Revaluation of assets and liabilities -Issue of Bonus Shares and Dividend by Subsidiaries -Reciprocal Stock holding. (20 Hours)

Module V.
Final Accounts of Insurance Companies -Final Accounts of Life and General Insurance Companies in the prescribed forms -Determination of profit of Life Insurance Business. (15 Hours)

Practice Hours	(10 Hours)
Total Hours	**90 Hours**

BOOKS FOR REFERENCE:

1. Advanced Accounts. - M.C. Shukla and T.S. Grewal
2. Advanced Accounting - Ashok Seghal & Deepak Seghal
3. Advanced Accountancy - R.L Gupta & M. Radhaswami
4. Advanced Accountancy - Arulandan & Raman
5. Advanced Accountancy - S.P. Jain & K.L. Narang
6. Accountancy - Dr. S. Kr. Paul
7. Corporate Accounting - S.N. Maheswari & S.K. Maheswari

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KANNUR UNIVERSITY

COM3C13 INCOME TAX LAW AND PRACTICE

90 Hours **Credit 04**

COURSE OBJECTIVES:
To provide the students an in-depth knowledge of the basic concepts of Income Tax and the provisions relating to the computation of Total income and tax liability of an individual assesse.

Module I.
Introduction -Basic concepts -Capital and Revenue -Residence and incidence of Tax -Exempted incomes. (10 Hours)

Module II.
Heads of income -Salary -Chargeability -Computation -Allowances -Perquisites -Profits in lieu of Salary -Provident Funds -Deductions (15 Hours)

Module III.
Income from House Property -Chargeability -Annual Value -Computation –Deductions (15 Hours)

Module IV.

Profits and Gains of Business or Profession -Business -Profession -Chargeability -Computation of Profits and Gains -Deductions -Amounts not deductible -Depreciation (15 Hours)

Module V.
Capital Gains -Chargeability -Short term and Long term -Computation -Deductions -Exemptions Computation of Tax. (10 Hours)

Module VI.
Income from other Sources -Chargeability -General -Specific -Computation –Deductions (5 Hours)

Module VII.
Aggregation of Income -Clubbing -Set Off and carry forward of losses -Deductions from Gross Total Income -Computation of Total income and Tax liability of Individuals and HUF. (15 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Mehrotra & Goyal : Income Tax Law and Practice : Sahitya Bhavan, Agra
2. V.K. Singhaniya : Direct taxes Law and Practice : Taxman
3. B.S. Raman : Income Tax Law & Practice : United Publishers
4. Bhagvati Prasad : Direct Taxes : Viswa Prakasan
5. A.P. Philip : Direct Taxes Law ad Practices : SOBA Publications

KANNUR UNIVERSITY

COM3C14 WEALTH TAX AND INDIRECT TAXES

90 Hours **Credit 04**

COURSE OBJECTIVES:
To provide an overview of the indirect tax system in India and an in-depth understanding of the Wealth Tax Act, 1957.

Module I
Wealth Tax Act 1957 -Chargeability -Deemed wealth -exemptions -Valuation of assets Computation of net wealth and tax. (20 Hours)

Module II
Customs Act 1962 -Definitions -Notified goods -Specified goods -Levy of duty -Warehousing, clearance and transport of goods -Drawback of duties -Adjudication and appeal before customs authorities and Tribunal. (15 Hours)

Module III
Excise Duty -Central Excise and Salt Act of 1944 -Nature and Scope of levy -excisable goods manufacture -Valuation of excisable goods -Types of duties -Payment of excise duty -Removal of goods -CENVAT -Exemption -Recovery and refund of duties -Appeals.
(15 Hours)

Module IV
Service Tax- Basics Concepts-Point of taxation-place of provision of service- Abatements and Exemptions-main provision of service tax- Computation of Service Tax- Assessment procedure- Appeals, Refund and Penalties. (10 Hours)

Module V
Value added Tax -Features -Taxable and exempt supply -Input and output -Basic VAT rates Goods outside VAT -Calculation of VAT -Manufacturer’s stage and Retailer’s stage -Merits and Demerits of VAT -Incidence and Levy -input Tax credit -Turn over -Registration and permit Security -Suspension of Registration. (20 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. V.S. Datey : Indirect Taxes -Law and Practice
2. R.K. Jain : Central Excise Law Manual and Central Excise
3. Taxman’s : CENVAT Law and Procedure
4. Dinkar Pagare : Business Taxation
5. H.C. Mehrotra and Goyal : Direct and Indirect Taxes
6. Vinod K. Singhania : Direct Taxes Law and Practice

KANNUR UNIVERSITY

COM3C15 HUMAN RESOURCE MANAGEMENT

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To familiarize the students with the human resource management processes.
2. To sensitize them to the training process and techniques, and
3. To provide them with appropriate knowledge and skills required for selecting, developing and managing human resources.

Module I

Human Resource Management (HRM) : Functions of HRM. Role and status of HR Manager in an organization. HR policies: HR planning process; Recruitment: Selection; Training and Development; Performance appraisal: methods of techniques of performance appraisal; promotion and Demotions; Transfer, Separations: resignation; discharge; dismissal; suspension; retrenchment: lay off; Industrial relations. Emerging issues in HRM.
(30 Hours)

Module II

HRD: Concept of HRD: Training and development: Training process: an overview: role, responsibilities and challenges to training managers and employees; Organisation and management of training function; training needs assessment and action research; instructional objectives and lesson planning; learning process. (15 Hours)

Module III

Training climate and pedagogy: developing training modules; training methods and techniques; facilities and training aids. Technical training: training for TQM: attitudinal training, training for management change; training for productivity; training for creativity and problem solving; training for leadership and training for trainers. (15 Hours)

Module IV

Grievance handling: Grievance -meaning and causes of grievance -importance and procedure of grievance handling; Hot Stove rule; code of discipline. Suggestion scheme; Importance of suggestion scheme; implementation of suggestion scheme. (10 Hours)

Module V

(a) HR outsourcing: legal requirements; contractor’s liabilities; liabilities of the company towards contractor’s labourers.
(b) HR records: objectives of HR record : absenteeism:
(c) HR appraisal and audit: concept, scope, methods and importance of HR audit
(d) Group dynamics. (10 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Aswathappa K. : Human Resource and Personnel Management; Tata McGraw Hill, New Delhi 1997.
2. Hollway J. ed: Performance Measurement and Evaluation: Sage Publications; New Delhi 1995.
3. Gupta. C.B: Human Resource Management;
4.Heneman and Schwal: Human Resource Management.
5. Prasad L.M.: Human Resource Management.
6. P.G. Aquinas Human Resource Management-Principles and Practice

KANNUR UNIVERSITY

ELECTIVE -FINANCE

COM4E01 SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To acquire knowledge of securities markets and its theoretical foundations
2. To help the students to equip the trading of securities.

Module I :

INVESTMENT: Meaning and Objectives-Financial Market and its Functions-Classification-Investment Avenues –Financial Assets: Non marketable and Marketable-Money Market Instruments, Fixed Income Securities, Equities and Mutual Fund Schemes. Investment Attributes- Risk Return Trade off-Investment v/s Speculation- Hedging- Portfolio Management Process.

Contact Hours – 10

Module II :

SECURITIES MARKET: Participants in the Securities Market and their Roles- Structure of Securities Market- Primary Market and Secondary Market Operations- Trading Mechanism-Stock Market Quotations- Stock Market Indices – BSE, NSE, OTCEI- Role of SEBI. Government Securities Market- Corporate Debt Market.

Contact Hours -20

Module III :

SECURITY ANALYSIS: Debt Instruments and their Valuation- Bond Characteristics- Bond Prices- Bond Yields- Rating of Bonds- Equity Instruments and their Valuation- Fundamental Analysis: Economy, Industry and Company Analysis- Technical Analysis: Charting Tools- Dow Theory- Elliot Wave Theory- Market Indicators- Derivatives and their Valuation.

Contact Hours -20

Module IV :

PORTFOLIO THEORY: Portfolio Return and Risk- Capital Market Pricing Model- Efficient Market Theory- Random Walk theory- Markowitz Model- Arbitrage Pricing Theory- Prospect Theory. Portfolio Management Frame work-: Objectives and Constraints, Asset Mix, Selection of Securities and Portfolio Execution.

Contact Hours -15

Module V :

PORTFOLIO PERFORMANCE EVALUATION- Rate of Return- Risk- Performance Measure- Treynor’s Measure- Sharpe’s Measure- Jenson’s Measure- Problems of Portfolio Management- Active and Passive Portfolio Strategies- Rebalancing Portfolios- Portfolio Management Plans- Formula Plans- Cost Averaging Plan- Constant Value Plan- Constant Ratio Plan- Variable Ratio Plan- Portfolio Revision.

Contact Hours -15

Practice Hours	(10 Hours)
Total Hours	**90 Hours**

BOOKS FOR REFERENCE:

1. **Prasanna Chandra**: Security Analysis and Portfolio Management-Tata McGraw Hill Publishing Co. Ltd.
2. **Punithavathy Pandyan**: Security Analysis and Portfolio Management- Vikas Publishing House Pvt Ltd.
3. **M. Ranganathan & R. Madhumathi**: Security Analysis and Portfolio Management- Dorling Kindersley Pvt. Ltd.
4. **Donald E. Fischer & Ronald j. Jordan**: Security Analysis and Portfolio Management- Prentice Hall Inc.
5. **Bhalla, V. K.**: Investment Management- S. Chand & Co.
6. **Avadhani, V. A.** : Security Analysis and Portfolio Management- Himalaya Publishing House
7. **Hull, J:** Options, Futures and Derivatives- Prentice Hall Inc, New Delhi
8. **Preethi singh:** Investment Management - Himalaya Publishing House, Mumbai
9. **Dr. Kevin, S.:** Portfolio Management

KANNUR UNIVERSITY

ELECTIVE A -FINANCE

COM4E02 INTERNATIONAL FINANCIAL MANAGEMENT

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To introduce the basic concepts and tools of International Financial Management.
2. To provide them appropriate knowledge about foreign investment and financing decisions.

Module I

International Financial Management: Meaning; importance; scope; Problems; recent changes in International Financial Markets; foreign exchange markets; exchange rate definitions; spot and forward rates; alternative exchange rate regimes. (15 Hours)

Module II

Exchange rate determination; theories of foreign exchange rate; purchasing power parity theory; International fisher effect; portfolio balance model; balance of payment theory; exchange rate of rupee; recent trends; convertibility of Indian rupee. (20 Hours)

Module III

International monetary system: features, present exchange rate system; reforms of International monetary system; European monetary system; International debt; ABD; IBRD and IMF; functions; special schemes of lending; conditionalities of IMF lending; International liquidity and IMF; SRDs; International markets and instruments. (20 Hours)

Module IV

Balance of payment: meaning; accounting principles; valuation and timing; components; deficit and surplus; macro-economic factors affecting exchange rates; some open economy identities; open economy multipliers; SWIFT and interbank clearing among banks in different countries. (15 Hours)

Module V

Foreign investment and financing decisions: FII, FDI-types, motives and Effects -current issues in FDI -India's foreign investment policy. (10 Hours)

Practice Hours	(10 Hours)
Total Hours	**90 Hours**

BOOKS FOR REFERENCE:

1. Henuing Charles -International Financial Management (Tata McGraw Hill)
2. Shapin Alan C -International Financial Management (Prentice Hall of India)
3. Aple. P.G. -International Financial Management (Tata McGraw Hill)
4. Alan C. Shapiro -Multi National Financial Management (Prentice Hall of India)

KANNUR UNIVERSITY

ELECTIVE A -FINANCE
COM4E03 FINANCIAL MARKETS AND SERVICES

90 Hours **Credit 04**

COURSE OBJECTIVES: The objective of the course is help the student:
1. To understand the structure, organization and working of financial markets and institution in India.
2. To understand the various financial services available.

Module I
Financial Markets

Money and capital markets – money market – meaning – constituents – functions of money market – money market instruments – call money – treasury bills – certificates of deposits – commercial bills, trade bills etc – recent trends in Indian money market – Capital Market - depositary systems – government securities market – recent developments in financial markets (20 hours)

Module II
Derivative Trading

Derivative trading – futures and options – forward markets – options – put options – call options – swaps – interest rate swaps – currency swaps. (10 hours)

Module III
Development Banks

Concept – objectives and functions of development banks – operational and promotional activities of development banks – IFCT – ICICI – IDBI – IRBI – SIDBI – state development banks – state financial corporations. (10 hours)

Module IV
Non-Banking Financial Institutions

LIC and GIC – insurance regulatory and development authority – role and functions – objectives and functions of UTI – role of UTI in industrial finance – concept and role of non-banking financial institutions – sources of finance – functions – investment policies of non – banking financial institutions in India – venture capital institutions. (15 hours)

Module V
Mutual Funds and Merchant Banking

Concept – performance appraisal and regulation of mutual funds (with special reference to SEBI Guidelines) – designing and marketing of mutual funds schemes – latest mutual fund schemes in India – concept of merchant banking – functions and growth – government policy – SEBI guidelines – future of merchant banking in India – role of merchant bankers in fund raising. (15 hours)

Module VI
Factoring

Concept – forms of factoring – legal aspects – factoring services in India.
Credit rating – concept – types of rating agencies Credit cards – concept – billing and payment – settlement procedure – corporate credit cards – business cards – users of credit cards – current developments. (10 hours)

Practice Hours	(10 hours)
Total Hours	**90 hours**

BOOKS FOR REFERENCE:

1. Avadhani. Investment and Securities Markets in India, Himalaya publishing House, New Delhi.
2. Bhole, L.M. Financial Markets and Institutions, Tata Mc Graw Hills, New Delhi.
3. Bhalla, V.K. Investment Management.
4. Ghosh, D. Banking Policy in India, Allied Publications, New Delhi.
5.Giddy, I.H. Global Financial Markets, A.I.T.B.S. New Delhi.
6. Khan, M.Y. Indian Financial System, Tata Mc Graw Hills, New Delhi.
7. Varshney, P.N. Indian Financial System, Sultan Chand and Sons New Delhi.
8. Averbach, Robert, D. Money Banking and Financial Institutions, Himalaya Publishing House, Mumbai.
9.Machiraju, H.R. Merchant Banking: Principles and Practice.

KANNUR UNIVERSITY

ELECTIVE A -FINANCE
COM4E04 CORPORATE TAX PLANNING AND MANAGEMENT

90 Hours **Credit 04**

COURSE OBJECTIVES:
To acquaint the students with the method of computing total income and tax liability of different types of persons (excluding individuals and HUFs), to understand the concepts of tax planning and management; and the tax implications of various managerial decisions.

Module I
Assessment of Firms -Association of Persons -Trusts -Companies -Co-operative Societies. (20 Hours)

Module II
Income Tax Authorities -Assessment procedure -Collection -Advance Tax -TDS Recovery and Refund -Offences -Penalties and Prosecutions -Appeals and Revision. (10 Hours)

Module III
Introduction to Tax Management -Tax planning, Tax avoidance and Tax evasion -Tax planning for new business -Setting up -Location -Form of Organisation -Nature of business. (15 Hours)

Module IV
Tax planning and managerial decisions -Employee remuneration -Capital structure Dividend policy -Make or Buy decisions. (20 Hours)

Module V
Tax planning and business restructuring -Amalgamation -Merger -Shut down or continue (15 Hours)

Practice Hours	(10 Hours)
Total Hours	**90 Hours**

BOOKS FOR REFERENCE:

1. Vinod K. Singhania: Direct Taxes Law and Practice : Taxman’s, Delhi.
2. Vinod K. Singhania: Direct Tax Planning and Management: Taxman’s, Delhi.
3. R.N. Lakhotia: Corporate Tax Planning : Vision Publications, Delhi.
4. Ahuja and Ravi Gupta : Systematic approach to Income Tax and Central sales Tax: Bharath Law House, Delhi.
5. Mahrotra and Goyal : Corporate Tax Planning and Management: Sahitya Bhavan, Agra.

KANNUR UNIVERSITY

ELECTIVE B -MARKETING

COM4E05 CONSUMER BEHAVIOUR

90 Hours **Credit 04**

Course Objectives:

1. To understand the buying influences and behaviour of consumer and
2. To understand the models of consumer decision making.

Module I

Introduction to consumer behaviour -Need of the study of consumer behaviour in modern marketing Meaning and definition -nature, scope and application -consumer behaviour and consumer education -problems in studying consumer behaviour. The role of consumer research -limitations of the study of consumer behaviour. (15 Hours)

Module II

Marketing environment -Micro and Macro Environment -changing pattern of consumer expenditure -income and savings -levels of personal income -consumer adoption -social influence on consumers -demographic influence on consumer behaviour. (15 Hours)

Module III

Consumer needs and Motivation -Consumer needs and birth of buying idea-buying motives -positive and negative motivation -rational VS emotional motives -models of consumer decision making -economics models -psychological models -Sociological model -Howard Sheth model -recent trends in modeling consumer behaviour. (20 Hours)

Module IV

Consumer buying process -An overview of decision process -problem recognition and information search -information processing -Alternative evaluation -Purchase process and post purchase behaviour. (15 Hours)

Module V

Group dynamics and consumer behaviour -Meaning and types of groups -reference groups and group dynamics -family as a group -family buying influences and buying roles -culture and subculture influence and their influence on buying behaviour. (15 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Consumer Behaviour - Leon G Schiffman & Leslie Lazer Kanuk.
2. Consumer Behaviour in Marketing Strategy - John A Howard.
3. Consumer Behaviour : Concepts and Applications - Laudsan Della.
4. Consumer Behaviour in India - Anitha Ghatak.
5. Problems of Consumer Behaviour in India - A Sarkar.

KANNUR UNIVERSITY

ELECTIVE B -MARKETING

COM4E06

ADVERTISING AND SALES MANAGEMENT

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To make the students understand the issues related with advertisement salesmanship.
2. To help the students to equip the various tools in salesman shipment and selling practices.

COURSE INPUTS:

Module I

New developments in the selling practice -Telemarketing -relationship marketing -Retail selling and business to business selling -Electronic media -Emerging trends.

Contact Hours -15

Module II

Sales promotion and advertising -Evolution of Advertisement -Functions -Purpose Criticism of advertising -Causes of failure of advertising -Advertisement media and selection . Contact Hours -15

Module III

Media Advertisement -Press -Magazines -Direct advertising -Cinema -Radio -TV etc.

Contact Hours -10

Module IV

Salesmanship and Sales Management -Salesmanship Definition -Importance of personal selling -Salesmanship whether productive or not -salesman authority -Knowing the sales field -Allocation of territory -Quota selling -techniques of sales forecasting.

Contact Hours -25

Module V

Sales manager -qualities -duties -sales force management -Recruiting -selecting Training -Compensation plans -Motivation -Evaluation. Contact Hours -15

Practice Hours Contact Hours – 10

Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Paylee J. F. : Marketing Principles
2. Manomoria & Joshi : Principles and Practices of Marketing India.
3. Dr. N. Rajan Nair : Marketing.
4. R. L. Joshi : Principles and Practices of marketing in India.
5. Prasher Ajay Marketing practices & Marketing Strategy.
6. Chunnawalla & Sethia : Foundation of Advertising theory & practices.

KANNUR UNIVERSITY

ELECTIVE -MARKETING

COM4E07 SERVICES MARKETING

90 Hours **Credit 04**

COURSE OBJECTIVES:
To understand the present day markets of services including Banking, Insurance, Tourism, Hospital and consultancy services.

Module I
Introduction -Nature and Types -Distinction between Services and Good marketing Environment for Services marketing -segmentation -targeting and positioning -service marketing mix -pricing, promotion and distribution of services. (15 Hours)

Module II
Bank marketing -Concept -Users -Products -Bank marketing in the Indian Environment. (12 Hours)

Module III
Insurance Marketing -Concepts -Users -Products -Insurance marketing in the Indian Environment. (12 Hours)

Module IV
Tourism and Hotel Marketing -Concept -Users -Products -Tourism marketing in the Indian perspective -Hotel markets -Concepts -Users -Products -Hotel marketing in the Indian Environment. (15 Hours)

Module V
Consultancy Marketing -Concept -Users -Products -Consultancy marketing in the Indian Environment. (13 Hours)

Module VI
Hospital Marketing -Concepts -Users -Products -Hospital marketing in the Indian Environment. (13 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. S.M. Jha : Services Marketing. Himalaya Publishing House.
2. Payana Adrim : An Essence of Services Marketing. Prentice Hall.
3. Christopher H. Lovelock: Services Marketing : Prentice Hall.

KANNUR UNIVERSITY

ELECTIVE -MARKETING COM4E08

LOGISTICS MANAGEMENT

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To enable the student to understand the fundamentals of logistics and the process involved storing, packing and distributing goods and the costs involved in these processes.
2. To enable the student to understand modern trends in logistical operations.

Module I

Introduction to Logistics -Management: meaning, features, scope, and importance, competitive advantage and logistics -supply chain and competitive performance -marketing and logistics interface -the work of logistics -integrated logistics, objectives, barriers to integration -logistics information -application of information technology. (20 Hours)

Module II

Inventory planning: concept, characteristics, types -conceptual frame work -inventory categorization -cost associated with inventory -inventory management techniques -EQQ, ABC Analysis, modern techniques, inventory management policies -inventory handling. (20 Hours)

Module III

(a) Transportation -principles, participants in transportations decisions, modes of transport cost -factors.

(b) Warehousing-need for warehousing management -role of logistical system- warehouse design, strategies, functions.

(c) Storehouse operation and control -objectives -activities of store -organizing the store store location and layout -storage system -classification and codification -modern techniques-store keeping -verification. (20 Hours)

Module IV

Logistics costing -Total logistics cost -logistic performance evaluation -Activity based costing -logistical measurement -logistical organization. (10 Hours)

Module V –

Containers and Packages Management Packing techniques and materials -Techniques for mass distribution of consumer goods importance of packaging in cost reduction and sales promotion. (10 Hours)

Practice Hours (10 Hours)

Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Lamber D. et al - Strategic Logistics Management (Tata McGraw Hill)
2. Donald T. Boverox, David J Close, Omar K, Helferich -Logistical management (Mac Million Publishing Company)
3. Bowersox and Closs - Logistics Management
4. Krishnaveni Muthiah - Logistics Management and World Sea Home Trade (Himalaya Publishing Company.

KANNUR UNIVERSITY ELECTIVE C -

INTERNATIONAL BUSINESS

COM4E09 INTERNATIONAL BUSINESS ENVIRONMENT

90 Hours **Credit 04**

Course Objectives:

1. To give the students an in-depth understanding about the global market in the changing world.
2. To provide to the students knowledge about the functional areas of the subject.

Module I

Dimensions of the International Environment : Global Economy and Globalisation Process Forces -Meaning, dimensions and stages in Globalisation -Kenchi Ohmae Model Internationalization v/s Globalization : the role of FDI -Transactional or Multinational Corporations -TNCs as drivers of the Global Economy -Trends in Globalisation Process -Globalisation of the firm -Organizational Debate. (15 Hours)

Module II

The Cultural & Social Environment: Cultural Diversity and Environment -Culture Defined Relation to business -National Cultures -Languages -Religion -Western values v/s Asian values Multicultural Societies -Culture Theories -Organization Culture -Culture Change -Cultural Globalization : Myth and Realty -Types of Society -Development of Modern Industrial Society Stratification in Societies -Changing Population -Urbanization -Labour Relations -Gender and Work -Families. (15 Hours)

Module III

Political Environment : The Political Sphere and Society -Nation states and Political Framework-Sources of Authority in the State -Democracy v/s Authoritarianism -Democratic Government Unitary and Federal Systems -Systems of Government : Presidential, Parliamentary and Hybrid Systems -Transitional Democracies -Global Politics.

(10 Hours)

Module IV

The International Legal Environment of Business : Interface between Legal System and Business -National Legal System -Legal Framework of the European Union -International Business Transactions -Resolution of Disputes in International Business -Crime Corruption and the Law -The growing impact of International Law on Business -Human Rights.

(15 Hours)

Module V

World Trade and International Competitive Environment : International Trade Theories -Trade Policy and National Priorities -Tools of Governmental Trade Policy -International Regulation of Trade -Trade Liberalization: The Doha Round -Regionalism -Developing Countries and World trade -Globalization and the World Trading system. (15 Hours)

Module VI

Technology and Innovation: Concepts and Process -Technological Innovation Theories -National Innovation Systems -Patents and Innovation -Technology Transfer -Information and Communication Technology (ICT) -Biotechnology -Globalization and Technological Innovation.

(10 Hours)

Practice Hours (10 Hours)

Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. International Business Environment, The Text and Cases, Sundaram & Black, Prentice Hall of India.
2. The Essence of International Business, Taggart and McDermott, Prentice Hall of India.
3. International Business, J. V. Prabhakara Rao and A.V. Ranganadhachary.
4. Janet Morrison, The International Business Environment Palgrave Macmillan, New York, 2007.
5. Bhall, V.K. and S. Shivaramu, International Business Environment and Business, New Delhi, Anmod, 1995.
6. Bhall, V.K. International Economy, Liberalisation Process, New Delhi, Anmol, 1993.
7. Daniel, John D and Rdebangh, Lee H. International Business, 5th ed., New York, Addision Wesley, 1989.
8. Eiterman, D. K. and Stopnehill, Al. Multinational Business Fianance, New York, Addision Wesley, 1986.

KANNUR UNIVERSITY ELECTIVE C -

INTERNATIONAL BUSINESS

COM4E10 FOREIGN TRADE MANAGEMENT

90 Hours **Credit 04**

Course Objectives:

1. To give the students an understanding about the dimensions of foreign trade.
2. To familiarize them with the risks in foreign trade and the tools of managing them.
3. To acquaint them with the institutions and agencies that monitories the foreign trade

.

Module I

Dynamics of Foreign Trade: International Business -Distinction between foreign trade and domestic trade. Need and Significance of Foreign Trade, Free Trade vs. Protection Balance of Payment : Concept, Disequilibrium in BOP -Structural, Cyclic and Monetary Disequilibrium -Methods of correction -Trade barriers and Trade Strategy -International Trade Theories and their Business Implications -Process of Globalization (20 Hours)

Module II

Mechanics of Foreign Trade : Export Trade and Import Trade -Gains from Trade and Terms of Trade -Classical, Neo Classical and Modern Approach -Measurement of Gains from International Trade -Terms of Trade -Concepts -Tariffs and Quotas -Concepts of Optimum Tariff -Quotas: Meaning, Types and Effects. (20 Hours)

Module III

Problems of International Payments: Exchange Rates: Theories of Exchange Rate Determination -Spot and Forward Exchange Rates -Foreign Exchange Market -Methods of International Payments -International Liquidity -International Monetary Fund -Special Drawing Rights -Exchange Rate of Policy -Euro -Dollar Market. (15 Hours)

Module IV

Foreign Exchange Risk Management: Exchange Rate Movements -External and Internal Techniques of Risk Exposure Management -Management of Economic, Transaction and Translation Exposure – Hedging Operations. (10 Hours)

Module V

Legal and Institutional Framework for Foreign Trade: Special Economic Zones Regional Trading Blocks -European Economic Community -EU, NAFTA, SAARC -Bilateral and Multilateral Trade Laws -General Agreement on Trade and Tariffs (GATT) -World Trade Organization (WTO) -Seattle and Doha round of Talks -Dispute settlement mechanism under WTO -GATS -IPRs. (15 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Jeevanandam C., “Foreign Exchange: Practices, Concepts and Control”, Sultan Chand,
2. The Essence of International Business, Taggart and McDermott, Prentice Hall of India.
3. International Business -Francis Cherunilam.
4. International Business -Rao and Rangachari.
5. Black and Sundaram : International Business Environment, Prentice Hall of India, New Delhi.
6. Gosh, Biswanath : Economic Environment of Business, South Asia Book, New Delhi.
7. Aswathappa : International Business, Tata McGraw Hill Publications, New Delhi.
8. Schmothoff C.R. : Export Trade -The Law and Practice of International Trade.
9. WTO and International Trade – M.B. Rao

KANNUR UNIVERSITY ELECTIVE C -

INTERNATIONAL BUSINESS

COM4E11 INTERNATIONAL BANKING

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To enable the students to familiarise the banking activities in modern era.
2. To study the banking activities in the International Market.

Module I

Nature and Background of International Banks -Major National Financial Markets and their integration -International Finance and Investment -International Financial Institutions -IMF, World Bank, BIS, IIF -lending services -Documentation -Foreign Exchange Service -Investment Banking Services -Convertibility -Country Risk -Exchange Control Regulations -Features of the Liberalised Exchange Rate Management System (LERMS) -Role of RBI -Effect of Financial, Political and Economic events on the exchange rate. (15 Hours)

Module II

International Banking Market -Innovations -Added Sophistication regarding Derivatives, Futures and Options -Basel I & II Agreements -Financial Investments and Techniques -Currency and Interest Rates -Swaps, Commercial Papers -Their Variance -Syndication of Loans -Pricing and Marketing of Syndicated Loans -Rating of Banking and Non-banking Financial Institutions -Criteria for Ranking and Rating Agencies. (15 Hours)

Module III

Sources of Funds -Consideration for the bank as a borrower -Retail and Wholesale Customer and Inter -Bank Deposits -Certificates of Deposit and Bearer Deposit Notes -Bankers acceptances Commercial Papers -Private Placement -Subordinated Debit Issues (Fixed and Floating rate) raised by banks on the Domestic and the International Capital Markets -Banking Supervision RBI requirements -Internal Control -Risks Management -Exchange Control Regulation of Euro Market. (10 Hours)

Module IV

International Cash Management -Management of Accounts and Cash Positions -Reconciliations Liquidity -Central Bank Requirements -Switching of Funds -Targeting -Yield Objectives. (10 Hours)

Module V

Foreign Exchange -Loan Deposit and Security Transactions in Foreign Currencies –Foreign Exchange Regulations -Interests Accruals, Commission and Fees -Margin Requirements -Funding of Branch -Inter-Bank Agency Arrangements -Correspondent Bank and Inter-group of relationships. (10 Hours)

Module VI

Foreign Exchange Rates -Measuring Rate Movements -Factors affecting foreign exchange rates Forecasting Exchange Rates -International Party Relationship -Interest Rate Parity, Purchasing Power Parity and Fischer affects -Transaction Exposure -Hedging against Foreign Exchange Exposure. (10 Hours)

Module VII

Forward Market -Future Market -Options Market -Currency Swaps -Cross Currency Swaps Interests Rate Swap -International Financial Instruments (10 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Richard M. evich - International Financial Markets -Tata McGraw Hill, New Delhi.
2. Adrian Buckley - Multinational Finance, Prentice Hall of India, New Delhi.
3. Vyuptakesh Shran - International Financial Management, Prentice Hall of India, New Delhi.
4. V. Sharma - International Financial Management.
5. P.G. Apte - International Finance -A Business Perspective.
6. V. K. Bhalla - International Finance Management.

KANNUR UNIVERSITY ELECTIVE C -

INTERNATIONAL BUSINESS

COM4E12 INTERNATIONAL MARKETING

90 Hours **Credit 04**

COURSE OBJECTIVES:

1. To provide the students a theoretical framework regarding International Market.
2. To give an in depth understanding about the institutional infrastructure relating to International Market.

Module I

International Marketing -Definition -Scope -Concepts -Reasons and Motivations -Global Vs Domestic Marketing -Concepts of Export -International Marketing Management -World Trade and India's Foreign Trade; an overview -Institutional Framework for Exports in India.

(10 Hours)

Module II

Global Marketing Environment -Cultural, Political, Legal and Economic Environment -PEST Analysis -Strategic Planning and Growth Strategies in International Marketing.

(10 Hours)

Module III

International Market Selection -International Marketing Research -Methods of conducting International Marketing Research -Development and management of International Marketing research. (10 Hours)

Module IV

Forms of International Market Entry -Export and Import activities -Market Entry Methods requiring low capital Investment (licensing and franchising) -Capital Intensive Entrance into Foreign Markets Factors influence decisions about the entry options. (10 Hours)

Module V

Segmentation of International Markets -Segmentation Strategies -Criteria for the Segmenting of the Consumer Goods Markets -Selection of Target Markets -Positioning in the International Environment . (10 Hours)

Module VI

International Product Policy -Adaptation of the International Product Policy -International Product Policy -International Product Mix -Phase in the Product Life Cycle -International Brand Policy New Trends -Strategies in Brand Management. (10 Hours)

Module VII

International Pricing Policy -Factors in Selection of Pricing Policy -Policies through out the Product life cycle -Process of creating prices -International Distribution Policy -Trends in International Distribution Policy -Influence of Internet on International Distribution.

(10 Hours)

Module VIII

International Communication Policy -Communication Strategies in the International Environment Instrument of the International Communication Mix -International Advertisement and Sales Promotion -Personal Selling and other forms Direct Marketing.

(10 Hours)

Practice Hours (10 Hours)
Total Hours **90 Hours**

BOOKS FOR REFERENCE:

1. Varshney and Bhattacharya -	International Marketing Management. An Indian Perspective. Sultan Chand and Sons, New Delhi.
2. Keegen -	Global Marketing Management, Prentice Hall of India, New Delhi
3. Philip Cateora & John Graham -	International Marketing. Tata McGraw Hill, New Delhi.
4. D.C. Kapoor -	Export Management. Vikas Publishing House, New Delhi.
5. Francis Cherunilam	International Trade & Export Management
6. Mishra M. V.	International Marketing Management
7. M.L. Varma	Foreign Trade Management in India
8. Kripalani V. H.	International Marketing.
9. Rajagopal	International Marketing.

Annexure V

Model Question Paper M.COM. (Pattern)

(Questions should be asked from all modules following a uniform distribution.)

Time : 3 Hrs. Max. Marks: 60

Section –A

(Answer any FOUR ……….)
1 mark for part a)
3 marks for part b)
5 marks for part c)

1.a) Direct type question (to test knowledge acquired)
b) Understanding type
c) Problem type (Ability to synthesize knowledge or critical evaluation of knowledge)

2. a)…………………………………………
b)…………………………………………..
c)…………………………………………

3. a)…………………………………………
b)…………………………………………..
c)…………………………………………

4 a)…………………………………………
b)…………………………………………..
c)…………………………………………

5 a)…………………………………………
b)…………………………………………..
c)…………………………………………

6 a)…………………………………………
b)…………………………………………..
c)…………………………………………

(4 x 9 =36 Marks)

Section B

7. a) Essay question from one or more modules (Don’t repeat the same module)
or
b) Essay question from one or more modules (Don’t repeat the same module)

8. a) Essay question from one or more modules (Don’t repeat the same module)
or
b) Essay question from one or more modules (Don’t repeat the same module)
(2 x 12 =24 Marks)

KANNUR UNIVERSITY

MODEL QUESTION PAPERS (M.COM.)

FOR THE POST GRADUATE DEGREE PROGRAMME IN
COMMERCE (M.Com) UNDER CREDIT BASED SEMESTER SYSTEM (CBSS-PG)
FOR AFFILIATED COLLEGES IMPLEMENTED WITH EFFECT
FROM 2014-15 ACADEMIC YEAR

Submitted to

THE KANNUR UNIVERSITY

PG BOARD OF STUDIES COMMERCE

Reg. No.................................. *Model Question Paper*

Name.....................................

First Semester M. Com. Degree Examinations, November 2014

COM1C01 – BUSINESS ENVIRONMENT AND POLICY

Time: 3 Hours **Max. 60 Marks**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define the term ‘business environment’.
   b) List the major components of the internal and external environment of business.
   c) “Firms which systematically analyze and diagnose the environment are more effective than those which don’t.” Elucidate.

2. a) What do you understand by ‘Multi - National Corporations’?
   b) Write any six characteristics of globalizations?
   c) What are different modes of Foreign Direct Investment in India?

3. a) What are Scheduled Industries?
   b) What are the functions of the Central Advisory Council for industries in India?
   c) Examine the powers of the Government of India to control and regulate industrial operations in the country.

4. a) Define the term ‘Corporate Governance’.
   b) Explain Clause 49 of the Securities Exchange Board of India Act.
   c) “Ethics and profits, though contradictory to each other, can go together.” Do you agree? Substantiate your answer.

5. a) State the meaning of the term ‘mixed economy’?
   b) Discuss the constituents of the economic environment of business.
   c) Explain the economic policy regime influencing business in India.

6. a) What do you understand by ‘LERMS’?
   b) Discuss the powers and functions of DGFT in India.
   c) Examine the highlights of he Foreign Trade Policy 2009-14 of the GOI.

[4x9= 36 marks]

Page-2

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) "By social responsibility we mean the intelligent and objective concern for the welfare of the society". Comment

OR

b) Examine the rationale for industrial policy in developing economies in the background of the current industrial policy of India.

8. a) Explore the major provisions of the FEMA 1999 by examining the need for the replacement of the FERA 1973 with it.

OR

b) Briefly discuss the Rules of WTO and analyze the sector-wise impact of these rules on the Indian economy.

[2x12=24 marks]

Reg. No.................................. Model Question Paper

Name.....................................

First Semester M. Com. Degree Examinations, November 2014

COM1C02 – QUANTITATIVE TECHNIQUES & OPERATION RESEARCH

Time: 3 Hours **Max. 60 Marks**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define probability.
   b) What are mutually exclusive events?
   c) One card is drawn from a standard pack of playing cards. What is the probability that it is neither a king nor a queen?
2. a) What is a random variable?

   b) What do you mean expectations?

   c) A petrol pump proprietor sells on an average Rs.800000 worth of petrol on rainy days and an average Rs.1000000 on clear days. The statistics from the meteorological dept. shows that the probability for clear weather is 0.86 and for a rainy weather is 0.14 for the coming Monday. Find the expected value of petrol sale on this day.
3. a) Define Binomial distribution.

   b) What are the properties of Normal distribution?

   c) The mean of Binomial distribution is 20 and the standard deviation is 4. Calculate n, p and q.

4. a) Define Hypothesis.

   b) State the features of a good hypothesis.

   c) Explain Type I & Type II errors.

5. a) What is linear programming?

   b) How is LPP applied in transportation problem?

   c) List down the advantages of network techniques.

6. a) Define operation research?

   c) Compare Iconic and analogue operation research model.

   d) Which are the prominent tools in O.R?

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

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7. a) The life time of electric bulbs for a random sample of 10, from a large consignment gave the following data.

Item:	1	2	3	4	5	6	7	8	9	10
Life in ‘000 hours:	4.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.4	5.6

Can we accept the hypothesis that the average life of bulb is 4000 hours?

Or

b) In a bolt factory, machines M_1, M_2, M_3 manufacture respectively 25, 35 and 40 percent of the total output. Of their output 5, 4 and 2 percent respectively, are defective bolts. One bolt is drawn at random from the product and is found to be defective. What is the probability that it is manufactured in the machine M_2?

8. a)A firm proposes to purchase some fans and sewing machines. It has only Rs.5760 to invest and

a space for at most 20 items. A fan costs Rs.360 and a sewing machine Rs. 240. Profit expected from a fan is Rs.22 and from a sewing machine is Rs. 18. Using graphic method of solution determine the number of fans and sewing machines, he should purchase to maximize his profit. Also, ascertain the maximum possible profit he can earn.

Or

b) A small maintenance project consists of the following jobs whose precedence relationships are given below:

Job	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Duration: (days)	15	15	3	5	8	12	1	14	3	14

i)Construct a network diagram.

ii) Find the total float for each activity.

iii) Find the critical path and the total project duration.

[2x12=24 marks]

COM1C02

Reg. No.................................. *Model Question Paper*

Name.....................................

First Semester M. Com. Degree Examinations, November 2014

COMIC03 –MANAGEMENT INFORMATION SYSTEM

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is M.I.S?

   b) Define MIS?

   c) What are the characteristics of MIS?

2. a) What is office automation?

   b) What are the different areas of office automation?

   c) What are the potential risks of information system?

3. a) What is data?

   b) Differentiate between Data and Information.

   c) Explain the Mathematical definition of information.

4. a) What is a system?

   b) What is system analysis? Why is it initiated?

   c) Explain the components of Structured System Analysis

5. a) What is system implementation?

b) What are the physical components of MIS?

c) Explain the steps involved in system implementation?

6. a) What is data communication and networking?

b) What are the different kinds of networking?

c) What is WWW? Explain how it works.

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) What is Business Data Processing? Explain the steps in Data Processing

OR

b) Define MIS, identify its components and describe its characteristics.

8. a) Explain data and information. What is data reduction? What are the methods of data reduction?

OR

b) Explain the latest trends in information technology

[2x12=24 marks]

Reg. No.................................. *Model Question Paper*

Name.....................................

First Semester M. Com. Degree Examinations, November 2014

COMIC04 – ORGANIZATIONAL BEHAVIOUR

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. Define Organisation Behaviour. State the significance of OB. What are the challenges and opportunities for OB.
2. What is motivation? Describe the process of motivation. How does the Mc Gregor's theory influence management decision making process in an organisation?
3. Explain organisational change. State the factors affecting change. Resistance to change is oftenviewed negatively, discuss some possible benefits of resistance to change in an organisation.
4. What is a group? Describe the types of group. Assume that you are to be placed in charge of a student group in the class, outline the key action steps you will take to make sure that the group develops into a real team.
5. What are ulterior transactions? Describe some of the major sources of inter-personal conflict? Which do you think is most relevant in today's organisation?
6. What is personality? What are its determinants? In your view which personality theory has greatest practical application. Why?

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) Compare and contrast Maslow's need hierarchy theory of motivation with Herzberg's two factors theory of motivation.

OR

b) State the meaning of OD. Give an account of OD interventions.

8. a) What is perception? Describe the factors influencing perceptual mechanism.

OR

b) What is conflict? Explain the various forms of conflicts that occur within an organisation.

[2x12=24 marks]

Reg. No...................................

Model Question Paper

Name......................................

First Semester M. Com. Degree Examinations, November 2014

COMIC05 – ACCOUNTING FOR BUSINESS DECISIONS

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is responsibility centre?

   b) Explain i) programme budgeting and ii) participative budgeting.

   c) The following data relate to a company which had a profit plan approved for selling 5000 units per month at an average selling price of Rs.10 per unit. The budgeted variable cost of production was Rs. 4 per unit and fixed cost were budgeted at Rs.20000, planned income being Rs. 10000 per month. Because of shortage of r aw material, the plant could produce only 4000 units and the cost of production was increased by 0.50 per unit. Consequently the selling price was raised by Re. 1 per unit. To modify production processes in order to meet material shortage, the company incurred an expenditure of Rs1000 in research and development. Set out a performance budget and a summary report.

2. a) Define capital rationing.

   b) Describe the steps in capital budgeting.

c) A company is considering an investment proposal to purchase a machine costing Rs. 2,50,000. The machine has a life expectancy of 5 years and no salvage value. The company tax rate is 40%. The firm uses straight line method of providing depreciation. The estimated cash flows before tax after depreciation from the machine are as follows.

Year	Cash flow(Rs.)
1	60,000
2	70,000
3	90,000
4	1,0,0000
5	1,50,000

Calculate (a) Pay back period (b) ARR (c) Net Present Value and (d) Profitability Index at 10% discount rate.

Note:

Year	1	2	3	4	5
P V Factor at 10%	0.909	0.826	0.751	0.683	0.621

3. a) Define cost of capital

b) State the importance of cots of capital.

c) Calculate cost of capital in the following cases.

i) X Ltd issues 12% debentures of the face value Rs.100 each and realizes Rs.95 per debenture. The debentures are redeemable after 10 years at a premium of 10%.

ii) Y Ltd issues preference shares of face value Rs. 100 each carrying 14% dividend and he realizes Rs. 92 per share. The shares are repayable after 12 years at par.

Note: both companies are paying income tax at 50%.

4. a) What is decision tree analysis?

b) Write brief notes on 'risk ' and 'return'.

c) The Globe Manufacturing Company Ltd is considering an investment in one of the two mutually exclusive proposals - Project X and Y, which requires cash outlays of Rs. 3,40,000 and Rs.3,30,000 respectively. The Certainty Equivalent Approach is used in incorporating risk in capital budgeting decisions. The current yield on Government bonds is 8% and this be used as the risk less rate. The expected net cash flows and their certainty equivalents (CE) are as follows.

Year – end	Project X		Project Y	
	Cash inflow	C E	Cash inflow	CE
1	180000	0.8	180000	0.9
2	200000	0.7	180000	0.8
3	200000	0.5	200000	0.7

Present value factors of Re.1 discounted at 8% at the end of year 1, 2 and 3 are .926, .857 and .794 respectively.

Required

(a) Which project should be accepted?
(b) If risk adjusted discount rate method is used, which project would be analysed with a higher rate?

5. a) Define management accounting.

b) Explain the objectives of management accounting.

c) Evaluate how management accounting is useful to the decision makers.

6. a) What is responsibility accounting?

b) Explain the use of social and government accounting in business decision.

d) Critically examine the new trends in accounting.

[4x9= 36 marks]

COM1C05

Page-3

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7.a) A company is considering an investment proposal to purchase a machine costing Rs. 2,50,000. The machine has a life expectancy of 5 years and no salvage value. The company tax rate is 40%. The firm uses straight line method of providing depreciation. The estimated cash flows before tax after depreciation from the machine are as follows.

Year	Cash flow(Rs.)
1	60,000
2	70,000
3	90,000
4	1,0,0000
5	1,50,000

Calculate (a) Pay back period (b) ARR (c) Net Present Value and (d) Profitability Index at 10% discount rate.

Note:

Year	1	2	3	4	5
P V Factor at 10%	0.909	0.826	0.751	0.683	0.621

OR

b) The following information has been extracted from the balance sheet of Fashions Ltd as on 31-3-2013. (Rs.in lakhs)

Equity		400
12% debentures	400	
Term Loan (18%)		1200
Total		2000

i) Determine the weighted average cost of capital of the company. It has been paying dividend at a consistent rate of 20% pa.

ii) What difference will it make if the current price of the Rs.100 share is Rs.160?

iii) Determine the effect of income tax on the cost of capital under both premises (Assume Tax 50%)

8. a) Explain Zero base budgeting. State the process and advantages. Also explain how it differs from traditional budgeting.

OR

b) A company is considering two mutually exclusive projects X and Y. project X costs Rs.30000 and Project Y costs Rs. 36000. Given below is the Net Present Value profitability distribution for each project.

Project X Project Y

NPV Estimate	Profitability	NPV Estimate	Profitability
3000	0.1	3000	0.2
6000	0.4	6000	0.3
12000	0.4	12000	0.3
15000	0.1	15000	0.2

i) Compute the expected net present value of Project X and Y.

ii) Compute the risk attached to each project, ie, standard deviation of each profitability distribution.

iii)which project do you consider more risky and why?

[2x12=24 marks]

COM1C05

Reg. No..................................

Model Question Paper

Name.....................................

Second Semester M. Com. Degree Examinations, April 2015

COM2C06 – STRATEGIC MANAGEMENT

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

2. a) What do you understand by ‘mission’?
   b) Differentiate between conventional decision making and strategic decision making.
   c) Discuss the various levels at which strategy operate.

3. a) What is SWOT Analysis?
   b) Compare and contrast between General Environment and Relevant Environment.
   c) What is ETOP? How is a summary ETOP prepared? Illustrate.

4. a) What are business level strategies?
   b) Interpret the interface between business level strategies and corporate level strategies.
   c) Discuss Michael Porter’s approach to defining generic competitive strategies.

5. a) What is the use of Gap Analysis?
   b) List the contents of a typical Strategic Plan.
   c) Discuss the strategic implications of each of the following types of business in a corporate portfolio: (i) Stars, (ii) Question Marks, (iii) Cash Cows, and (iv) Dogs.

6. a) Why is leadership implementation relevant in strategic management?
   b) Discuss the approaches to create a strategy supportive culture in business organizations.
   c) Suggest some practical steps that strategists can take to make strategic use of politics and power mechanism in organizations.

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) Describe the scheme of grand strategies operating at the corporate level as proposed by William F. Glueck.

OR

b) Discuss the nature and importance of strategic evaluation and control. What are four major types of strategic control typically adopted by organizations?

8. a) Strategy formulation is not entirely an analytical process, but it takes into account the non-analytical or subjective factors too." Discuss.

OR

b) Define strategic management. Schematically discuss the different phases of strategic management process.

[2x12=24 marks]

COM2C06

Reg. No.................................. *Model Question Paper*

Name.....................................

Second Semester M. Com. Degree Examinations, April 2015

COM2C07 – RESEARCH METHODOLOGY AND COMPUTER APPLICATION

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define Research.

b) What is Social research? State its objectives.
c) Differentiate between Induction and Deduction methods of research.

2. a) What is meant by Research Problem?
   b) State the requisites of a good research problem.
   c) Distinguish between pure and applied research.
3. a) What is Research Design.
   b) Explain the importance of Research design.
   c) What are exploratory research designs? Explain the methods used for such designs.
4. a) What is a research report?
   b) How are computers used as a tool in research?
   c) Describe the qualities of a good research report.
5. a) What are non-parametric test?
   b) State the advantages of non-parametric test.
   c) Explain one tailed and two tailed test.
6. a) What do you mean by Analysis of Variance?
   b) State the various assumptions of Analysis of Variance?
   c) What are the uses of Chi-square test?

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a)The following figures relate to production in kilogram of three varieties of wheat sown in 12 plots

A: 14 16 18

B: 14 13 15 22

C: 18 16 16 19 20

Is there any significant difference in the production of the three varieties?

OR

b) Eight coins were tossed 256times. The results obtained are given below. Test whether the coins are unbiased.

No. of Heads:	0	1	2	3	4	5	6	7	8
Frequency:	2	10	25	50	75	58	21	9	6

8. a) In a certain a district A, 450 persons were considered regular consumers of tea out of a sample of 1000 persons. In another district B, 400 were regular consumers of tea out of a sample of 800 persons. Do these figures reveal a significant difference between the two districts as far as tea drinking habit is concerned?

OR

b) Define Research. Explain the various steps in Research Process.

[2x12=24 marks]

COM2C07

Reg. No...................................

Name.....................................

Model Question Paper

Second Semester M. Com. Degree Examinations, April 2015

COM2C08 – COSTING FOR MANAGEMENT DECISIONS

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is Differential Costing?

b) Distinguish between Differential Costing and Marginal Costing.

c) State the areas of application of Differential Costing.

2. a) What is Value Analysis?

   b) Distinguish Value Analysis and Value organizing.

   c) What are the advantages of Value Analysis?

3. a) Define Cost of Capital.

   b) Explain the importance of the concept of Cost of Capital in Financial Management.

   c) Explain the methods of calculation of Cost of Retained Earnings.

4. a) Define Margin of Safety.

   b) What are the uses of margin of safety in decision making?

   c) The following particulars relate to a Company for two periods:

Period	Sales	Profit
I	Rs.1,20,000	Rs.9,000
II	Rs.1,40,000	Rs.13,000

Assuming that the cost structure and Selling prices remain the same in the two periods, find out: a) P.V. Ratio b) BEP Sales and c) Margin of Safety in two periods___________________________

5. .a) What is weighted average cost of capital?

   b) What are the different basis to calculate the weighted average?

   c) Calculate the cost of equity capital in the following case:

   A company issues equity shares of Rs.10/- each for public subscription at a premium of 20% . The company pays @ 5% as under writing commission on issue price. Expected rate of dividend by equity shares is 25%

6. a) What is meant by break-even analysis ?

   b) What are the assumptions of Break-even analysis?

   c) From the following information , find out the Break Even Point in units and sales value:

   Budgeted output - 75,0000 Units
   Fixed Expenses - Rs.5,00,000
   Variable Expenses per unit – Rs.10
   Selling price per unit - Rs.20

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7 .a) What is reporting? Discuss the various functions of reporting. What are the contents of a good report?

OR

b) What is cost reduction? What are the areas of cost reduction? What are the techniques of cost reduction?

8.. a) In a Factory the budgeted and actual figures of the cost of material and direct labour Incurred in the production during the month of January are the following:

	Actual	Budgeted
Units of finished goods produced	90,000 Units	1,00,000 Units
Material Units	1,82,000 Units	2,00,000 Units
Cost of Material per unit	Re.0.52	Re.0.50
Total Cost of materials	Rs.94,640	Rs.1,00,000
Direct Labour Hours	47,000	50,000
Wage Rate	Rs.2.10p/hr	Rs.2.00p/hr
Total direct Labour cost	Rs.98,700	Rs.1,00,000

You are required to make an analysis of material and labour variance and verify these with total cost variances.

OR

b) A Company's Flexible Budget at various levels of production reveals the following :

Output in 000 Units	**Selling price per unit**	**Total Semi. Fixed cost**	**Total Variable Cost in 000**	**Total Fixed in 000**
30	24	150	418	142
60	22	150	818	142
90	20	170	1278	142
120	18	170	1579	142
150	16	200	1778	142
180	14	200	1902	142

You are required to :

a) Prepare a schedule of total differential cost and increment in revenue.

b) At what interest level should the company set its level of production?

c) What selling price is recommended by you, in order to maximize the products

[2x12=24 marks]

COM2C08

Reg. No..................................

Model Question Paper

Name....................................

Second Semester M. Com. Degree Examinations, April 2015

COM2C09 – ADVANCED BUSINESS ACCOUNTING

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is Asset backing method ?

b) What are the needs for valuation of Shares?

c) On 31st December 2012 the Balance Sheet of a limited company disclosed the following position.

Liabilities	Rs.	Assets	Rs.
Issued Capital in Rs.10 share	400000	Goodwill	40000
Reserves	90000	Fixed Assets	500000
Profit & Loss Account	20000	Current Assets	200000
5% Debentures	100000		
Current Liabilities	130000		
	740000		740000

On 31st December 2012 the Fixed Assets were valued at Rs.550000 and Goodwill at Rs.50000. Compute the value of Shares by Asset backing method.

2. a)What is GAAP ?

b) State the need for Accounting Standards.

c) Explain Accounting Standard Board .

3. a) What is cum-interest.?

b) Distinguish between cum- interest and ex- interest transaction.

c) On 1st July 2012 , Madhura Investment Ltd. held Rs. 100000,6% Debentures of Gerald Ltd. which appeared in the books at Rs.96500. Interest is payable on 31st July and 31st January. On October 1, 2012 a further Rs.50000 Debentures in Gerald Ltd. were bought at Rs.98 cum interest and on January, 1, 2013,a further Rs.30000 Debentures were bought at Rs.97 ex- interest. On 31st March 2013, Rs.80000 Debentures were sold at Rs.101 cum interest and on 1st June Rs. 60000 Debentures were sold at Rs.102 ex interest. Show investment Account for the period ending 30th June 2013.

4. a) What is COSA?

b) Explain the features of CCA Method.

c) The Balance Sheet of J Ltd. disclosed the following:

	January 1, 2012	December 31, 2012
	Rs.	Rs.
Trade Debtors	200000	260000
Advances to Suppliers	60000	80000
Trade Creditors	150000	160000
Index Number	100	120
Average for the year	110	

Calculate Monetary Working Capital Adjustment.

Page-2

5. a) Define Human Resource Accounting.

b) State the limitations of Human Resources Accounting.

c) Explain the different methods of evaluating Human Assets..

6.a) What is Public Account?

b) What are the objectives of Government Accounting?

c) Distinguish between Government Accounting and Commercial Accounting.

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) The premises of a Company was destroyed by fire which took place on 1st March,2012,and as a result of which the business was disorganized from 1st March to 31st July ,2012. Accounts are closed on 31st December every year. The company is insured under a loss of profit policy for Rs.750000. The period of indemnity specified in the policy is 6 months. From the following information, you are required to compute the amount of claim under the loss of profit policy.

	Rs.
Turnover for the year 2011	40 00000
Net profit for the year 2011	240000
Insured standing charges	480000
Uninsured standing charges	80000

Turnover during the period of dislocation (from1-3-2012to31-7-2012)	800000
Standard turnover for the corresponding period in the preceding year ie. from 1-3-2011to 31-7-2011	20,00000
Annual turnover for the year immediately preceding the fire (ie from 1-3-2011 to 28-2-2012	44.00000
Increased cost of working	150000
Savings in insured standing charges	30000
Reduction in turnover avoided through increased working cost	400000

Owing to reason acceptable to the insurer, the special circumstance clause stipulates for:

i) Increase of turnover (standard and annual) by 10% (ii) Increase of rate of Gross profit by 2%.

OR

b) On 31st December 2012, the Balance Sheet of a limited company reveals the following position.

Liabilities	Rs.	**Assets**	Rs.
Share capital in shares of Rs.10 each	400000	Goodwill	40000
General Reserve	190000	Fixed Assets (Tangible)	500000
Profit& Loss Account	120000	Current Assets	400000
14% Debentures	100000		
Current Liabilities	130000		
	940000		940000

On the above mentioned date, the tangible Fixed Assets were independently valued at Rs.350000 and Goodwill at Rs.50000. The net profits for the three years were : 2009- Rs.103200 :; 2010- Rs.104000; and 2011- Rs. 103300 of which 20% was placed to General Reserve , this proportion being considered reasonable in the industry in which the company is engaged and were a fair return on investment may be taken at 18%. Compute the value of Shares by (i) yield value method and (ii) earning capacity method.

8. a) The income statement for the year ended 31st December ,2012 and the Balance Sheet of R Ltd. as on 1st January 2012 are as follows:

Income Statement for the year ended 31st December 2012

	Rs.	Rs.
Sales		150000
Cost of Goods Sold:		

Opening Stock (FIFO)	30000	
Purchases	60000	
Cost of Goods available for Sale	90000	
Less: Closing Stock (FIFO)	10000	80000
Gross Profit on Sales		70000
Operating Expenses	20000	
Depreciation	10000	
Interest on Loan	5000	35000
Retained Earnings		35000

Balance Sheet as on 1st January 2012

Liabilities	Rs.	Assets	Rs.
Share Capital	100000	Plant& Machinery	100000
Bank Loan	25000	Stock	30000
Creditors	35000	Debtors	18000
		Cash	12000
	160000		160000

Debtors and Creditors balances remained constant throughout the year. General price indices were as given below: On 1st January 2012: 200; Average for the year: 240; On 31st December 2012: 300. You are required to prepare the Final Accounts for the year 2012 after adjusting price level changes under CPP Method.

OR

b). S.S.Himalaya set out on a voyage from Kolkatta to Mumbai. On December 31st, on which date the accounts are to be closed, the return voyage had not been completed. The details of the entire voyage to Mumbai and back to Kolkatta completed after 31st December were:

Freight Rs.400000: Coal consumption Rs. 70000: Stores Consumed Rs. 30000: Port charges Rs. 15000: Salaries of the Crew Rs. 40000: Insurance (ship) Rs. 20000: Insurance (freight) Rs. 8000: Primage 10%: Address commission 5%: Only Rs. 150000 freight was available on the return journey. Prepare the Voyage Account up to 31st December.

[2x12=24 marks]

COM2C09

Reg. No.................................. *Model Question Paper*

Name.....................................

Second Semester M. Com. Degree Examinations, April 2015

COM2C10 – FINANCIAL MANAGEMENT

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1.a) Define Financial Management

b) "Wealth Maximisation is superior criteria than profit Maximisation" Explain.

c) X needs Rs.10,00,000 for expansion. The expansion is expected to yield an annual EBIT of Rs.1,60,000. In choosing a financial plan, X Ltd', has an objective of maximising EPS. It is considering the possibility of issuing Equity shares and raising Debt of Rs.1,00,000 or Rs.4,00,000 or Rs.6,00,000, The current market price per share is Rs.25 and is expected to drop to Rs.20 if the funds borrowed in excess of Rs.5,00,000. Funds can be borrowed at the rates indicated below:

a) Up to Rs.1,00,000 @ 8%

b) Over Rs.1,00,000 – Rs.5,00,000 @ 12%

c) Over Rs.5,00,000 @ 18%

Assume a tax rate of 50%. Determine the EPS for the three financing alternatives.

2. a)What is Combined Leverage ?

b) Distinguish between operating Leverage & Financial Leverage.

c) A Company has sales of Rs.50,000. Variable costs are 40% of sales. Whereas, the fixed operating costs are Rs.15000. The amount of interest payable on long term debt is Rs.5,000. Find out the combined leverage and illustrate its impact of the company's taxable income if sales incres by 5%

3. a) What is optimum capital structure?

b) Explain NOI Theory of capital structure.

c) The expected EBIT of a company is Rs.2,75,000. The rate of equity capitalisation (Ke) is 20%. The Company has bonds of Rs.5,00,000 carrying 15% annual rate of interest. On the basis of the above data compute :-

1) The existing total market value (V) and the overall cost of capital (Ko) of the Company.

2) The impact on V on Ko, if the management takes a decision to increase debt by Rs.2,00,000

3) The impact on V and Ko in case the management decides to reduce its debt by Rs.2,00,000

4. a) What is Stable Dividend Policy?

b) What is "Arbitrage Process"? Explain.

c) What are the factors influencing Dividend Policy? Explain.

5. a) Define working capital.

b) What are the drawbacks of redundant working capital?

c) The Hindustan Chemicals belong to a risk class for which the appropriate capitalisation rate is 10%. It currently has 1,00,000 shares selling at Rs.100 each. The firm is intending the declaration of Rs.5 as dividend at the end of the current financial year, which has just begun. What will be the price of the share at the end of the year if a dividend is not declared? What it will be if one is getting dividend? Answer these on the basis of M-M Model and assume no taxes.

6. a) What do you mean by "operating cycle"?

b) What are the costs associated with investment in Sundry Debtors?

c) A firm's current credit sales are Rs.12,00,000 p.a. The firm is considering of lowering its credit standard (liberalising the credit policy) which will result in slowing the ACP from 1 month to 2 months. This relaxation is expected to increase sales by 20% The firm's RRR is 15%. At the existing level of sales the producing and selling cost is 90% of sales while the variable selling cost of incremental sales will be 70% of sales. Should the firm relax its credit policy?

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) Calculate the degree of operating Leverage, Financial Leverage and combined Leverage for the following firms and interpret the results

	P	Q	R
Out put in Units	3,00,000	75,000	5,00,000
	Rs.	Rs.	Rs.
Fixed Cost	3,50,000	7,00,000	75,000
Unit Variable Cost	1.5	7.5	0.10
Interest Expenses	25,00040,000		-
Unit Selling Price	3.00	25.00	0.50

OR

b) Explain the Theories of Capital Structure.

8. a) The following information is available in respect of a firm:

Ke = 10%; EPS = Rs.50

Assumed rate of return on investments:-

1) 12% 2) 8% 3) 10%

Show the effect of dividend policy on market price of shares applying Waters' Formula, when, Dividend payout ratio is 0%, 20%, 40%, 80% and 100%

OR

b). The following data have been extracted from the books of ABC Ltd.

	Rs. Per. Unit
Cost of raw materials	500
Cost of direct labour	160
Cost of over heads	320
Total Cost	980
Profit	220
Selling Price	1200

The following additional information is also given:

1) The average storage period for raw material is 1 month.
2) The average period for work-in-progress in production department is ½ month.
3) The average storage period for finished goods is 1 month.
4) The Co., is given 1 month credit facility by its suppliers for its purchases, whereas the Co., sells goods on 2 months credit to its customers
5) The time lag for payment of wages is 1½ weeks and overhead is 1 month.
6) 20% of total output is sold in cash basis.
7) The average level of cash in business is expected to remain at Rs.1,50,000.

Assuming 1 month = 4 weeks prepare an estimate of total working capital requirements for the Company for a volume of 13,000 Units of production, taking debtors at cost price.

[2x12=24 marks]

COM2C10

Reg. No..................................

Model Question Paper

Name.....................................

Third Semester M. Com. Degree Examinations, November 2015

COM3C11 – MARKETING MANAGEMENT

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. (a) Explain the concept of marketing.

(b) What do you mean by social marketing?

(c) Discuss the various bases of market segmentation.

2. (a) Define the concept of Buying Behaviour.

(b) Why buying behaviour is desirable to study in marketing?

(c) When an individual is member of several peer groups, are his consuming activities likely to be affected by all groups? Explain.

3. (a) What is a product?

(b) What do you understand by product planning? Explain its significance.

(c) Elucidate the various phases of PLC.

4. (a) What is meant by skimming the cream price policy?

(b) Discuss the factors affecting pricing decisions.

(c) Describe the three bases on which firms usually set their pricing in practice. Illustrate them.

5. (a) Define market segmentation.

(b) "Target market follows market segmentation." Discuss.

(c) Discuss the significance of market segmentation in India.

6. (a) Define salesmanship.

(b) What are the essentials of effective selling.

(c) "Salesmen are born and not made." Discuss.

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) Define the concept of promotion mix. What are its elements? What are the determinants of promotion mix?

OR

b) "Concentration, equalization, and dispersion are the soul of marketing." Discuss.

8. a) Discuss the key challenges that a marketer faces while entering into Indian rural markets.

OR

b) Elucidate the factors that are to be considered in the selection of media for advertising.

[2x12=24 marks]

COM3C11

Reg. No.................................. *Model Question Paper*

Name......................................

Third Semester M. Com. Degree Examinations, November 2015

COM3C12 – CORPORATE ACCOUNTING

Time: 3 Hours **[Max. 60 Marks]**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) What is amalgamation?

b) State the conditions to be satisfied to constitute "amalgamation in the nature of merger"

c) On 1st April 2012, A Ltd. and B Ltd. were amalgamated into C Ltd. on the basis of the following Balance sheets and other information:

(Rs. in lakhs)

Liabilities	A Ltd.	B Ltd.	Assets	A Ltd.	B Ltd.
Equity shares of Rs.100 each	800	750	Land& Building	550	400
12% Pref. Shares of Rs.100each	300	200	Plant& Machinery	350	250
General reserve	300	250	Investments	150	50
Investment Allowance Reserve	70	50	Stock in Trade	350	250
Profit& Loss Account	50	30	Debtors	250	300
10% Debentures of Rs.100 each	60	30	Bills Receivables	50	50
Creditors	270	120	Cash & Bank	300	200
Bills Payable	150	70			
	2000	1500		2000	1500

Additional information :- 1) 10% Debentures of A Ltd. & B Ltd. were discharged by C Ltd. issuing such number of its 15% Debentures of Rs. 100 each so as to maintain the same amount of interest. (2) Pre. Share holders of the two companies are issued equivalent number of 15% Pre. Shares of C Ltd. at a price of Rs.150 per share (face value Rs.100) (3) C Ltd. will issue 5 equity shares for each equity share of A Ltd. and 4 equity shares for each equity share of B Ltd. The shares are to be issued @Rs. 30 each, having a face value of Rs. 10 per share. (4) Investment allowance Reserve is to be maintained for 4 more years. Prepare Balance Sheet of C Ltd. after the amalgamation has been carried out.

2. a) What is Liquidation ?

b) What are the grounds for compulsory winding up?

c) LT Ltd. went into liquidation with the following Liabilities.

Secured Creditors Rs. 40000 (securities realized Rs. 50000)

Pref. Creditors – Rs. 1200, Unsecured Creditors –Rs. 61000, Liquidation Expenses – Rs.500.

The Liquidator is entitled to a remuneration of 3% on the amounts realized (including securities in the hands of secured creditors) and 1.5% on the amount distributed to the unsecured creditors. The various assets (excluding the securities in the hands of the secured creditors) realized Rs.52000. Prepare Liquidators Final Statement of Account.

3. a) What is Double Account System ?

b) State the criticisms against Double Account system.

c) From the following particulars draw up Capital Account and General Balance Sheet as on 31st March 2013 on Double Account system .

Share Capital Rs.2600000; 11% Debentures Rs. 400000; Trade creditors Rs.160000; Reserves Rs.150000; Debtors Rs.380000; Cash in Hand & at Bank Rs.350000; Investments Rs.150000; Stock Rs. 240000;

Expenditure to 31st March 2012: Land Rs. 120000; Machinery Rs.1350000; Building Rs. 530000. The expenditure during the year ended 31st March 2013 was Land Rs.250000; Machinery Rs.250000; Building Rs. 100000. Renewal Fund Rs.250000 has been created. Balance of Net Revenue Account Rs.160000.

4. a) Define Holding Company.

b) How do you ascertain the amount of minority interest?

c) H Ltd. acquires 3\4 of the share capital of S Ltd. on 31st December 2013 . The Balance Sheet of the two companies are as under

Liabilities	H Ltd.	S Ltd.	Assets	H Ltd.	S Ltd.
	RS.	Rs.		Rs.	Rs.
Share capital (in Rs.10 share)	200000	100000	Fixed Assets	200000	100000
General Reserve	50000	30000	Current Assets	130000	120000
Profit& Loss Account	30000	20000	Shares in S Ltd.	100000	--
10% Debentures	100000	50000			
Creditors	50000	20000			
	430000	220000		430000	220000

You are required to prepare the consolidated Balance Sheet as on 31st December 2013.

5. a) What is Life Assurance Fund?

b) How does Valuation Balance Sheet differ from Normal Balance Sheet?

c) The Life Fund of a Life Assurance Company was Rs.8648000 on 1st December 2012. The interim bonus paid during the inter valuation period was Rs.148000. The periodical Actuarial Valuation determined the net liability at Rs. 7425000.Surplus brought forward from the previous valuation was Rs.850000. The Director of the company proposed to carry forward Rs.931000 & to divide the balance between the share holders and the policy holders in the ratio of 1:10.Show the Valuation Balance Sheet, Net profit for the valuation period& distribution of surplus.

6. a) What is Internal Reconstruction ?

b) Explain the procedure for reducing Share Capital.

c) The following was the Balance Sheet of Continental Construction Ltd. as on 31-12- 2012

Liabilites	Rs.	Assets	Rs.

Authorized Capital			Goodwill		10000
20000 equity shares of Rs.10 each		200000	Land& Building		20500
Issued & paid up capital			Machinery		50850
12000 shares of Rs.10 each	120000		Stock		10275
Less: calls in arrear	9000		Cash at bank		1500
(Rs.3 per share on 3000 shares)		111000	Debtors		15000
Creditors		15425	Preliminary Expenses		1500
Provision for tax		4000	Profit& Loss A\C		
			Balance as per last		
			Balance sheet	22900	
			Less; profit for the year	2100	
					20800
		130425			130425

The directors found that the Machinery was overvalued by Rs.10000. It is proposed to write down its asset to its true value & to extinguish the deficiency in Profit & loss account and to write off Goodwill & preliminary expenses by adopting the following scheme. (i) Forfeit the shares on which call is outstanding. (ii) Reduce the paid capital by Rs.3 per share (iii) Reissue the forfeited shares at Rs. 5 per share. (iv) Utilize the provision for tax, if necessary. You are required to draft journal entries.

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) On 31st March 2012 the following was the Balance sheet of Moon Ltd.

Liabilities	Rs.	Assets	Rs.
120000, equity shares of Rs. 10 each	1200000	Plant&Machinery	900000
Capital reserve	20000	Furniture & Fittings	150000
Loan	360000	Stock	400000
Sundry Creditors	300000	Sundry Debtors	220000
		Cash at Bank	100000
		Profit&Loss A\C	110000
	1880000		1880000

A new company Suraj Ltd. was incorporated which took over the Fixed assets & Stock of Moon Ltd. for Rs.1260000 payable as to Rs.900000 in the form of equity shares of Rs.5 each and 360000 in the form of 3600 ,12% mortgage Debentures of Rs.100 each . Loan creditors accepted the Debentures in Suraj Ltd.on discharging of the loan. Sundry debtors realized Rs.205000. Expenses of liquidation amounted to Rs.8000 and were met by Moon Ltd. The available cash was distributed among sundry creditors in full satisfaction of their claims. Pass journal entries in the books of Suraj Ltd. and show important ledger accounts in the books of Moon Ltd. to close the books . Also show the initial Balance Sheet of Suraj Ltd.

OR

b) A Ltd. holds 80% of the share capital of B Ltd. & 70% of the share capital of C Ltd. At the date of acquisition of the shares ,the share holders funds of each of the two companies were as follows.

	B Ltd.	C Ltd.
Paid up capital	300000	160000
Reserves	70000	20000
Proft& Loss Account	50000	30000

Extracts from the Balance sheet of all the companies as at 31-3-2012 were as under

	A Ltd.	B Ltd.	C Ltd.		A Ltd.	B Ltd.	C Ltd.
Paid up capital	400000	300000	160000	Stock	120000	95000	30000
Reserves	150000	70000	20000	Debtors	100000	70000	50000
P\L A\C (balance)	90000	20000	14000	P& M	280000	260000	220000
Profit for the year Ended 30-6-2012	120000	35000	26000	Debentures in C Ltd.at par	20000	-	-
Debenrtures	200000	-	50000	Shares in B Ltd.	400000	-	-
Creditors	80000	30000	20000	Shares in C Ltd.	140000	-	-
Intercompany advances	30000	-	10000	Intercompany advances			
				A Ltd.	-	30000	-
				C Ltd.	10000	-	-
	1070000	455000	300000		1070000	455000	300000

Additional information :- (i) included in the stock in trade at 31st March 2012 were goods acquired from associated company on which profits have been made by the respective companies as under :A Ltd. Goods from B Ltd. at Rs.6000 above cost ; B Ltd. – Goods from C Ltd. at Rs 4000 above cost ; C Ltd. – Goods from A Ltd. at Rs. 2000 above cost

(ii) A Ltd. purchased an item of Plant from B Ltd. on 30th September 2011 for Rs. 24000 on which the latter company had made a profit of Rs. 2400. Depreciation had been charged in the accounts of the purchaser at 10% per annum. (iii) Dividends were paid during the year as follows. : A Ltd. – at the rate of 10% per annum. , C Ltd. : at the rate of 10% per annum. out of the pre acquisition profits. : B Ltd. – at the rate of 10% per annum out of the pre acquisition profits. (iv) A Ltd. has included all dividends received during the year in its Profit & Loss account. You are required to prepare a consolidated Balance sheet of A Ltd. and its subsidiaries as at 31st March 2012.

8. (a) Following are the details regarding Unfortunate Ltd. which went into voluntary liquidation as on 31-12-2012.

		Rs.
3000 equity shares of Rs. 100 each, Rs.80 called up & paid up		240000
6%,1000 Pre. Shares of Rs. 100 each fully paid up	100000	
Less calls in arrears (expected to realize in full)	5000	95000

55 Debentures having a floating charge on the assets	100000
(Interest paid up to 30th June 2012)	
Mortgage on Land & Building	80000
Trade Creditors	265500
Wages outstanding	20000
Secretary’s Salary (@Rs.500 per month) outstanding	3000
Managing Director’s salary (@Rs.1500 per month) outstanding	6000

Assets	Book value	Expected to produce
	Rs.	Rs.
Land &Building	120000	130000
Plant & Machinery	200000	130000
Tools	20000	4000
Patent	50000	30000
Stock	87000	74000
Accounts receivables	90000	60000
Investment (pledged with bank for an outstanding of Rs.190000)	180000	170000

On 31st December 2007, the Balance sheet of the company showed a General reserve of Rs. 40000 accompanied by a debit balance of Rs.25000 in Profit& loss account. In 2008, the company made a profit of Rs.40000 and declared a dividend of 10% on equity shares. The company suffered a total loss of Rs.109000 besides a loss of stock due to fire of Rs.40000 during 2009, 2010 &2011. In 2012, loss of Rs.128800was made. Prepare liquidators’ statement of accounts & deficiency account.

OR

(b) From the following particulars you are required to prepare Fire Revenue account for the year ended on 31st March 2013.

	Rs.		Rs.
Claims paid	480000000	Additional Reserve for unexpired risk	20000000
Claims Outstanding on	40000000	Reinsurance recoveries of claims	8000000
15th April 2012		Sundry expenses regarding claims	5000000
Claims intimated but not		Loss on sale of Motor car	5000000
accepted on 31-3-2013	10000000	Bad debts	3000000
Claims intimated & accepted		Refund of Double Taxation	5000000
but not paid on 31-3-2013	60000000	Interest & dividend	6000000
Premium received	1212000000	Income Tax deducted there from	1000000

Reinsurance premium paid	120000000	Legal expenses regarding claims	30000000
Commission	200000000	Profit on sale of investments	2000000
Commission on reinsurance	10000000	Depreciation on Furniture	6000000
Commission on reinsurance accepted	5000000	Rent of staff quarters deducted from salaries	2000000
Expenses of management	317000000		
Reserve for unexpired risk on 1-4-2012	400000000		

You are required to provide for additional reserve for unexpired risk at 1% of the net premium in addition to the opening balance.

[2x12=24 marks]

COM3C12

Reg. No..................................

Model Question Paper

Name.....................................

Third Semester M. Com. Degree Examinations, November 2015

COM3C13- INCOME TAX LAW AND PRACTICE

Time: 3 Hours **Max. 60 Marks**

Section A

Answer any ***four*** questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1 **a** What do you mean by Gross Total Income?

b Distinguish between capital expenditure and revenue expenditure for income tax purpose.

c Mr. John, a foreign national came to India for the first time on June 15, 2007. During the financial years 2007-08, 2008-09, 2009-10, 2010-11, 2011-12, and 2012-13, he stays in India for 120 days, 115 days, 15 days, 191 days, 124 days and 80 days respectively. Determine his residential status for the assessment year 2013-14.

2 **a** What is perquisite?

b State provisions of the Income Tax Act 1961, relating to the taxability of House Rent Allowance.

c Mr. A has retired from a private company on 30th November, 2012. He was working since 1st March, 1986. He received Rs. 2,00,000 as gratuity. His salary grade was 5,000-100-8,000-200-15000, since 1st March, 2001. He was also getting D.A. @ 25% of Basic Salary. Calculate his exempted gratuity (a) if comes under Gratuity Act, (b) if he doesn't under Gratuity Act.

3 **a** What do you mean by Block of Assets?

b Explain the provisions relating to the additional depreciation on plant and machinery.

c Sri. Shyam Lal is the owner of three houses. Compute his income from house property for the

assessment year 2013-14:

First House- Self-occupied for residence. Municipal value Rs.60000; Municipal tax Rs.12000 and interest on loan taken to purchase it on 1.5.2012 Rs.75000.

Second House- Municipal value Rs.6500, let out at Rs.500 p.m. Local taxes Rs.500; Repairs Rs.100; Ground rent Rs.100 and collection charges Rs.600.

Third house- Municipal value Rs.3000; used in his own business.

All the above expenses have been paid.

4 **a** What is Clubbing of Income?

b Distinguish between Short term Capital Gain and Long term Capital Gain.

c 'K' is the owner of a house property which he purchased in June, 1987for Rs.90000. He sold it for Rs.725000 on 15th May, 2012 and incurred an expenditure of Rs.10000 as brokerage. He bought a residential house on 15th January, 2013 for a sum of Rs.250000 and sold this house on 15th March, 2013 for a sum of Rs.300000 and paid a sum of Rs. 3000 as commission.

Compute the Capital gains chargeable for the Assessment Year 2013-14. Cost Inflation Index for 1987-88 is 150 and for 2012-13 is 852.

5 **a** What is Bond washing transaction?

b State the circumstances in which the income of the wife of an assessee is included in his total income.

c Sri Anand has the following investments for the previous year ended 31.3.2013:

i) 10% Rs.30000 tax-free Govt. securities.

ii) 10% Rs.40000 Karnataka Govt. loan.

iii) 10% Rs.36000 tax-free debentures (listed) of a company.

iv) 10% Rs.20000 debentures (listed) of a tea company.

v) Rs.7200 received as interest on debentures of a company (unlisted).

He paid commission to his bank Rs.500 for collecting the above amounts.

Find out his taxable ‘Income from interest on securities’ for the assessment year 2013-14.

6 **a** What is Agricultural income?

b Explain the procedure for the assessment of income.

c Calculate the amount of deduction u/s 80G:

	Rs.
i) Gross Total Income	300000
ii) Deduction u/s 80C to 80U (except 80G)	50000
iii) Donations by cheques:	
a) P.M. National Relief Fund	30000
b) Allahabad University – National eminence	20000
c) Technology Development and Application Fund	10000
d) P. M. Drought Relief Fund	10000
e) Charitable Society	10000
f) Family Planning	15000
g) Sports Association	20000

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. How residence of an assessee is is determined for income tax purposes? Explain the incidence of tax on the basis residence.

OR

Sri. Pramod is employed in a firm at Mumbai. He is in the grade of Rs.4400-110-5400. 1st January, 2009. He gets Rs.5000 per month as dearness allowance and Rs.15000 as medical allowance. He has been provided with a furnished accommodation by the employer owned by it, of the estimated rental value of Rs.2000 p.m. Furniture costing Rs.13000 has also been provided by the employer. He has been given a small car, which is used by him for his purpose also. The driver's remuneration and all the expenses relating to the car are borne by the employer. He has been provided with the facility of a gardener, a watchman and a servant who are paid by the employer @ Rs. 200 p.m., Rs.1000 p.m., and Rs.600 p.m. respectively.

He contributes 15% of his pay and dearness allowance to the recognised Provident Fund towards which the employer contributes Rs.1200 p.m. Interest amounting to Rs.1980 has been credited on the balance of Rs.22000 standing to the credit of his Provident Fund Account.

Assuming that the salary becomes due on the first day of next month. Determine his salary income for the assessment year 2013-14.

8. Discuss the provisions regarding set-off and carry forward of losses under the Income Tax Act, 1961.

OR

From the following, compute the business income of Sri. Vinod for the year 2012-13:

Income Statement

To Bad debts	7,000	By Gross Profit	2,66,100
,, Bad debts provision	1,500	,, Interest from debtors	3,000
,, Audit fees	3,500	,, Discount from creditors	2,500
,, Employees welfare expenses	4,200	,, Interest on loan to Ashok	5,000
,, Entertainment of customers	3,400	,, Bad debts recovered	8,000
,, Social welfare expenses	3,000	,, Enhanced compensation	25,000
,, Excise duty	20,000		
,, Income tax	14,000		
,, Establishment	50,000		
,, Depreciation	38,000		

,, Interest paid to Bank	13,000	
,, Car expenses	72,000	
,, Net Profit	80,000	____
	3,09,600	3,09,600

Additional information:

a) Rs. 50,000 was given as loan to Ashok.
b) During the year Rs. 5,000 interest was received.
c) Bad debts recovered were earlier disallowed.
d) Enhanced compensation is related to acquisition of Land.
e) Bad debts include Rs. 4,000 to his brother.
f) Excise duty was paid on 24.11.2013.
g) Establishment includes Rs. 10,000 paid to personal servant of Sri. Vinod.
h) Car is used 1/3rd for business and 2/3rd for Sri. Vinod.
i) Depreciation admissible as per Income Tax Act Rs. 41,500.

[2x12=24 marks]

COM3C13

Reg. No.................................. *Model Question Paper*

Name.....................................

Third Semester M. Com. Degree Examinations, November 2014

COM3C14- WEALTH TAX AND INDIRECT TAXES

Time: 3 Hours **Max. 60 Marks**

Section A

Answer any ***four*** questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define valuation date.

b) What is Deemed Wealth?

c) From the following information find out the value of jewelry as on 31-3-2014:

Value of jewelry determined by Registered Valuer and accepted by the department as on 31-3-2013.

Gold 2,000gm @ Rs.1,700/gm	Rs.34,00,000
Value of Gems and Pearls set in ornaments	2,00,000
	36,00,000

On 31-3-2014 the rate of gold is Rs. 1,900/gm. The assessee purchased jewelry during the previous year for Rs.1,50,000.

2. a) Who is an adjudicating authority under the Customs Act?

b) What do you mean by specified goods? Explain its provision in the Customs Act. c) From the following particulars calculate the customs duty payable:

Assessable value of important goods	Rs. 5,00,000
Basic customs duty payable @10%	

The important goods are also produced in India. On such goods excise duty is leviable @12%.

SAD @4% and Education cess @3% is leviable.

3. a) Name the taxable event for the charge of Excise Duty.

b) Distinguish between excise duty and customs duty.

c) The selling price of a product inclusive of excise duty @12% is Rs.2,800 /article. If 100 articles are produced and sold compute the

i) Assessable value and

ii) Total excise duty payable

4. a) Give the concept of “service” under the Service Tax

b) What do you understand by point of taxation?

c) Sharman (liable to pay Service Tax) gives the following particulars relating to the service provided to various clients by them for the half-year ended 30-9-2014:

i) Total bills raised for Rs.5,00,000 out of which payment of the bill for Rs.1,00,000 were not received till 30-9-2014.

ii) Amount of Rs.50,000 was received as an advance from STEPCO Ltd. On 1-9-2014 to whom services were to be provided in January 2014.

You are required to compute taxable value of services and the amount of service tax payable. The bills are exclusive of service tax.

5. a) List the three common methods for computation of VAT.

b) Describe the merits of VAT.

c) Input worth Rs.1,00,000 is purchased are sales are worth Rs.2,00,000 in a month, input tax rate and output tax rate are 4% and 12.5% respectively.

Calculate VAT and input tax credit/set-off.

6. a) Define Notified goods.

b) Who are eligible to avail for CENVAT? State the conditions for availing credit under CENVAT?

c) Briefly explain the mechanism of operation of VAT with the help of an illustration.

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks..

7 a) From the following particulars **compute the net wealth** of the resident Indian citizen.

		(Rs. In lakh)
(1)	Self acquired property	4.00
(2)	Let out house (whole year) residential property	5.00
(3)	Let out house (eight months)residential property self-occupied 4 months	5.00
(4)	Cash in hand	1.70
(5)	Jewellery for personal use	40.00
(6)	Flat in Delhi used as business office	10.00
(7)	Shares in companies	4.00
(8)	Motor car for personal use	1.80
(9)	Fixed deposit in the name of minor son	2.00
(10)	Urban land in Chennai acquired in 1-6-2013 held for industrial purpose	10.00
(11)	Flat in London	10.00

(12)Loan for purchase of jewellery	10.00

OR

b) Amit is a Chartered Accountant. His receipts from various professional services for the Quarter ending 30.9.2014 are as under:

	Rs.
(1) Taxation consultancy fees	4,26,250
(2) Remuneration for Accountant services	1,12,960
(3) Statutory Audit Fees	2,65,700
(4) Certification Fees	1,45,600
(5) Remuneration as Internal Auditor in public Ltd. Company	1,58,300
(6) Fees for appearing in appeals	1,47,400
(7) Amit also teaches at a coaching centre as a visiting faculty	1,43,200

Amit also got re-imbursed out of pocket expenses on actual basis from his clients Rs.85,900.

He has also incurred Rs.3,15,000 as establishment expenses of his office during the period.

Calculate the value of Taxable Service and Service Tax. Amit charges service tax separately in the bills raised and hence the above receipts are not inclusive of service tax.

8. a) Briefly explain the mechanism of operation of VAT with the help of an illustration.

OR

b) Explain how the valuation of excisable goods are done.

[2x12=24marks]

Reg. No.................................. *Model Question Paper*

Name.....................................

Third Semester M. Com. Degree Examinations, November 2014

COM3C15- HUMAN RESOURCE MANAGEMENT

Time: 3 Hours **Max. 60 Marks**

Section A

Answer any ***four*** questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. a) Define HRM.
   b) Explain the operative functions of HRM.
   C) What are the duties and responsibilities of HR manager in modern organization?
2. a) What do you mean by HRD?
   b) What are the merits of Training to employees?
   c) Is training a necessity? Explain.
3. a) What is code of discipline?
   b) Briefly explain the Hot Stove rule.
   c) What are the essentials of a good grievance procedure?
4. a) What is meant by HR record?

   b) What are the objective of HR record?

   c) Explain the meaning, scope and importance of HR audit.

5. a) Define recruitment.

   b) Distinguish between recruitment and selection.

   c) Briefly explain the employee selection procedure.

6. a) What do you mean by HR planning?

b) What are the objective of HR Planning?

c) Briefly explain HR Planning process?

[4x9= 36 marks]

Section B

Answer the following questions. Each question carries 12 marks.

7. a) What is performance appraisal? Explian any four methods of performance appraisal. What are the limitations of performance appraisal?

Or

b) Explian the various methods and techniques of training.

8. a) Explain the various steps involved in training process.

Or

b) What is grievance? Explain the grievance redressal mechanism of an organization with examples.

[2x12=24marks]

COM3C15

Reg. No.................................. *Model Question Paper*

Name.....................................

Fourth Semester M. Com. Degree Examinations, March 2016

COM4E01 - SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT

Time: 3 Hours **Max. 60 Marks**

Section B

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

2. a) What is stock index?
   b) Compare and contrast between SENSEX and NIFTY.
   c) For the basic index of 100, the following volume and price details are given. Compute current stock index using (i)Price Weighted Index Method, (ii) Equal Weighted Index Method, and (iii) Market Valued Index method. Assume nil dividends and no change in constituent stock options.

Stock	Outstanding Shares	Basic Price (₹)	Current Price (₹)
A1	2,00,000	70	150
A2	1,00,000	110	200
A3	3,00,000	150	450

3. a) What is Net Asset Value? How is it computed?
   b) Explain the different types of mutual fund schemes based on asset mix.
   c) Discuss SEBI regulations for secondary market in India.

4. a) What is book building?
   b) Discuss the basic assumptions of fundamental analysis.
   c) What are the quantitative models of equity valuation? Discuss their limitations.

5. a) Define convexity.
   b) What are the various risks that an investor should foresee while investing in bonds?
   c) Discuss the various ways in which the return from bonds are measured and expressed?

6. a) Define Relative Strength Index.
   b) Explain Dow Theory. How does it contrast with Random Walk Theory?
   c) Explain how technical analysis is useful to investors? How is different chart patters interpreted in the context of security analysis?

[4x9= 36 marks]

Section A

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. a) Decompose the security market in India into its constituents. Explain the role and importance of each of them in the functioning of the securities market.

OR

b) Define investment. Examine the different investment avenues available in India ,

highlighting the risks and advantages of each.

8. a) Explain the features of efficient market hypothesis and state its assumptions. What are the tools available for testing the hypothesis?

OR

b) What are portfolio management plans? Explain. What criterion is used to manage investment portfolios under different market conditions?

[2x12=24 marks]

COM4E01

Reg. No.................................. *Model Question Paper*

Name.....................................

Fourth Semester M. Com. Degree Examinations, March 2016

COM4E04 - CORPORATE TAX PLANNING AND MANAGEMENT

Time: 3 Hours **Max. 60 Marks**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. (a) What do you mean by MAT?
   (b) Explain the provisions of the ITA 1961, regarding Corporate Dividend Tax.
   (c) A (a women aged 70), B (aged 45) and C (aged 35) are members of an Association of Persons sharing in the ratio of 1:2:3. During the financial year 2010-11, the taxable income of the AOP was Rs. 9,00,000 while the personal incomes of A, B and C were Rs. 90,000, Rs. 1,00,000 and Rs. 1,50,000 respectively. Compute the tax liability of the AOP and the members A, B and C for the A.Y 2011-12.

2. (a) What is urban consumer's Co-operative Society?

   (b) Explain the deductions available to a co-operative society U/S 80P.

   (c) The following are the incomes of Ahsas Co-operative Society for the previous year ended on 31st March 2012:

	Particulars	Rs.
i)	Interest on Securities (gross)	6,000
ii)	Income from credit facilities to members	15,000
iii)	Income from purchase and sale of agricultural implements and seeds to its members	25,000
iv)	Income from marketing of agricultural produce of its members	25,000
v)	Profit from other businesses	60,000
vi)	Interest and dividends (gross) from other co-operative societies	10,000
vii)	Income from cottage industry	20,000
viii)	Rent received from house property	12,000

Compute total income and gross tax liability of the society for the AY 2012-13.

3 (a) What do you mean by HUF for tax purposes?
(b) How does the partition of the HUF affect the assessment of income?
(c) From the following particulars furnished by the Karta of a Hindu undivided family Compute the total income of the family for the assessment year 2011-12.

	Particulars	Rs.
1.	Profit from business	50,000
2.	Salary received by a member of the family employed in a Govt Dept	40,000
3.	Director's fees received by Karta (Individual capacity)	5,000

4.	Muncipal value of the property let out (rent receivable Rs. 10,000)	8,000
5.	Dividends from a Co-operative society	4,000
6.	Dividends from an Indian company	5,000
7.	Donations to Rajiv Gandhi Foundation	5,000

During the year the family sold some shares for Rs. 60,000 which were purchased on 1.3.1987 for Rs. 10,000.
The cost inflation indices for the financial years 1986-87 and 2010-11 are 140 and 711 respectively.

4. (a) What is TDS?
   (b) Explain the provisions relating to advance payment of tax?
   (c) Which are the modes of recovery of tax?

5. (a) Who is a NRI?
   (b) What advice would you give to a person having income in India and abroad and who stays in India and outside India for different time periods regarding residence?
   (c) A company requires you to suggest a scheme for remuneration to employees from tax point of view. Outline the various considerations that you will include in your report.

6. (a) Is there any benefit in holding a financial assets for more than 12 months before it is sold?
   (b) What the measures would you suggest with regard to management decision of 'shut down or continue' a loss making business.
   (c) "The loan capital contributes to tax saving resulting in a higher rate of return on owner's equity". Do you agree? Illustrate you answer with suitable examples.

[4x9= 36 marks]

Section A

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. What are the various authorities envisaged in the Indian Income Tax Law and what are their functions.

OR

X and Y are equal partners in a firm. From the following Profit and Loss Account compute the total income of the firm for the AY 2012-13.

Particulars		Rs.	Particulars	Rs.
Interest on capital@12%			Business Profits	4,30,000
	X	9,000	Income from house property	10,100
	Y	15,000	Capital gains:	
Remuneration to working			Long term	20,000
Partners:	X	1,60,000	Short term	10,000
	Y	1,30,000		
Approved charitable donations		10,000		
Profit:	X	73,050		
	Y	73,050		
		4,70,100		4,70,100

The remuneration and interest on capital are as per partnership deed. Other informations are:

1. X paid interest to the firm on drawings for household expenses Rs. 2,000, which is included in business profits.
2. Y paid interest Rs. 10,000 on money borrowed to contribute capital in the firm.
3. X purchased a car for Rs. 1,80,000 in June, 2011. The expenses on running and maintaining the car for the year are Rs. 20,000. He says that car has been used for the firm and other personal purposes. The use of the car for personal purposes may be taken as 50%. The proper amount has been charged to P&L A/c.

8. Explain the term ‘tax planning’, ‘tax avoidance’ and ‘tax evasion’ and distinguish between tax management and tax planning.

OR

Compute the taxable income of Prabhakar Ltd. for the PY 2012-13 from the following Profit and Loss Account and additional information:

Particulars	Rs.	Particulars	Rs.
To Salaries and bonus	1,00,000	By Gross profit	5,00,000
To Office rent	10,000	By Interest	10,000
To War risk insurance	10,000	By Short term capital gains	15,000
To Postage & Stationery	10,000		
To General charges	20,000		
To Reserve for Dep.	25,000		
To Income tax 2010-11	50,000		
To Provision for income tax 2011-12	2,00,000		
To Net profit	1,00,000		
	5,25,000		5,25,000

Additional information:

(a) The general charges include Rs. 5,000 for advertising; Rs. 1,000 for charitable donation; Rs. 3,000 paid to a Motor car company for exchanging the old car for a new one; Rs. 1,000 for charity and Rs. 5,000 for miscellaneous repairs.
(b) The amount of depreciation admissible under the Income Tax Act is Rs. 15,000 only.
(c) The amount of interest is from Govt. securities.

[2x12=24 marks]

COM4E04

Reg. No…………………………… *Model Question Paper*

Name………………………………

Fourth Semester M. Com. Degree Examinations, March 2016

COM4E01 - CONSUMER BEHAVIOUR

Time: 3 Hours **Max. 60 Marks**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. (a) What do you understand by consumer behaviour?

   (b) What is customer relationship management?

   (c) Distinguish between consumer and buyer.

2. (a) What do you mean by buying motives?

   (b) What are the characteristics of consumer behaviour?

   (c) Explain the importance of studying consumer behaviour in marketing.

3. (a) What are the different types of markets in India?

   (b) What are the defects of Indian market?

   (c) "Marketing environment offers both opportunities and threats". Discuss

4. (a) What do mean by business markets?

   (b) How do business buyers make their buying decisions?

   (c) Describe the Howard-Sheth model of consumer behaviour.

5. (a) Define consumer satisfaction.

   (b) State the personal factors influencing consumer.

   (c) Give a brief account of emotional and rational motives.

6. (a) What are the psychological factors that influence in consumer decision maker?

   (b) Point out the different steps in the buyer decision process.

   (c) Discuss the similarities and differences between business market and consumer market.

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. (a) What are buying motives? What are the different types of buying motives?

OR

(b) What are the different types of factors which influence the marketing environment?

8. (a) Discuss the cultural, social, personal and psychological factors that affect consumer behaviour.

OR

(b) Elucidate the different stages through which the business buyers make their buying decisions.

[2x12=24 marks]

COM4E01

Reg. No.................................. *Model Question Paper*

Name.....................................

Fourth Semester M. Com. Degree Examinations, March 2016

COM4E02 - ADVERTISING AND SALES MANAGEMENT

Time: 3 Hours **Max. 60 Marks**

Section A

Answer any *four* questions in this Section.

Each question carries 1 mark for Part (a), 3marks for Part (b), and 5marks for Part (c)

1. (a) What is direct marketing?

(b) Differentiate telemarketing from teleshopping.

(c) What are the different forms of direct marketing programmes?

2. (a) Define promotion.

(b) What is meant by the concept of the promotional blend?

(c) What are the basic types of promotion strategy.

3. (a) What is advertising?

(b) How is advertising effectiveness tested?

(c) "The success of the advertisement campaign depends on proper selection of the media for advertisement." Discuss.

4. (a) Define salesmanship.

(b) What are the essentials of effective selling?

(c) "Salesmen are born and not made." Discuss

5. (a) What is sales promotion?

(b) What is the significance of sales promotion in marketing industrial products?

(c) Distinguish between marketing and selling.

6. (a) What do you mean by sales organisation?

(b) What are the important functions of sales management?

(c) What are the qualities of an effective sales manager?

[4x9= 36 marks]

Section B

Answer the *two* questions in this Section.

Each question carries 12 marks.

7. (a) Do you think that advertising is an investment? Discuss.

OR

(b) What are the various kinds of tests commonly used in the selection of salesmen? What are the advantages of using tests? Are there any dangers?

8. (a) Personal selling is a two-way communication best suited to a company marketing consumer products with a poor brand loyalty. Discuss.

OR

(b) What is advertising? Discuss its objectives and point out the problems of advertising in India.

[2x12=24 marks]

COM4E01

KANNUR UNIVERSITY

(Abstract)

M.Sc Computer Science Programme – Scheme, Syllabus and Model Question Papers – Core / Elective Courses under – Credit Based Semester System – Affiliated Colleges - Implemented with effect from 2014 admission - Orders issued.

ACADEMIC BRANCH

U.O.No.Acad/C4/12581/2014 Dated: Civil Station P.O, 20-10-2014

Read:- 1. U.O.No.Acad.C1/11460/2013 dated 12-03-2014.

2.Minutes of the meeting of the Board of Studies in Computer Science PG held on 16/07/2014.

3.Minutes of the meeting of the Faculty of Technology held on 01/04/2014.

4.Letter dated 29/09/2014 from Dr. Raju Chairman, Board of Studies in Computer Science (PG)

ORDER

1.Revised Regulations for Credit Based Semester System for PG Programmes in affiliated Colleges have been implemented in this University with effect from 2014 admission vide paper read (1) above.

2.The Board of Studeis in Computer Science (PG) vide paper read (2) above, has finalized the Scheme, Syllabus and Model Question papers for M.Sc Computer Science under Credit Based Semester System with effect from 2014 admission.

3. As per paper read (3) above, the meeting of Faculty of Technology, approved the Scheme, Syllabus and Model Question papers for M.Sc Computer Science with effect from 2014 admission.

4.The Chairman, Board of Studies in Computer Science (PG) vide paper (4) above, has forwarded the Scheme, Syllabus and Model Question papers for M.Sc Computer Science for implementation with effect from 2014 admission.

5.The Vice Chancellor, after considering the matter in detail, and in exercise of the power of the Academic Council, conferred under Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the Scheme, Syllabus and Model Question Papers (Core/Elective Courses) for M.Sc Computer Science Programme in affiliated Colleges Under Credit Based Semester System with effect from 2014 admission subject to report Academic Council.

6. Orders are, therefore issued accordingly.

7. The implemented Scheme, Syllabus and Model Question Papers are appended.

Sd/-
DEPUTY REGISTRAR (Acad)
For REGISTRAR

To

The Colleges offering M.Sc Computer Science Programme.

Copy to:

1.The Examination Branch Through (PA to CE)
2.The Chairman, Board of Studies in Computer Science (PG)
3.PS to VC/PA to R/PA to CE
4.DR/AR-1 Academic

Forwarded/ by Order

SECTION OFFICER

KANNUR UNIVERSITY
M Sc COMPUTER SCIENCE
(Credit Based Semester System)
Regulations, Curricula, Syllabus and Scheme of Evaluation
(With Effect from 2014 admission)

REGULATIONS

1. **Duration** of the M. Sc. (Computer Science) programme shall be 2 years, divided into 4 semesters. Each semester shall have 90 working days.The maximum period of completion is eight semesters (4 years).

2.Eligibilityfor admission: As announced by the University from time to time.

3. Programme Structure

3.1 **Attendance*:*** The minimum attendance required for each course shall be 75% of the total number of classes conducted for that semester. Those who secure the minimum attendance in a semester alone will be allowed to register for the End Semester Examination. Condonation of shortage of attendance may be granted as per Kannur University PG regulation.

3.2 ***Credits:*** The total minimum credits, required to complete M. Sc. Computer Science programme is 80 in which minimum credits required for core (including practical and project) courses is 60 and for Elective courses is 12.

3.3 **Theory and Practical courses**

The evaluation scheme for each Theory and Practical courses except MCS3C16 Research Methodology shall contain two parts; (a) Continuous Assessment (CA) and (b) End Semester Evaluation (ESE). 20% marks shall be given to CA and the remaining 80 % to ESE. For MCS3C16 Research methodology the evaluation is 100% internal and shall follow the distribution applicable to theory CA.

CONTINUOUS ASSESSMENT (CA)

Theory : The components oftheory evaluation are as follows:

	COMPONENTS	% OF MARKS
i	**Test papers**	**40%**
ii	**Assignment**	**20%**
iii	**Case Study / Seminar / Viva**	**20%**
iv	**Attendance**	**20%**

i. *Test Papers*: There shall be a minimum of two test papers to be conducted for each course. If more than two test papers are conducted, then two best scores shall be taken for the award of IA marks. The dates of test papers shall be announced well in advance and the marks should be displayed in the notice board.

ii. *Assignments:* One or more assignments (including practical assignments) shall be given for each course. The mode of assessment of the assignments shall be decided by the faculty concerned with due approval from the department council and shall be declared at the beginning of the semester. (It is suggested that to the extent possible, give individual assignments and also conduct short viva based on the assignment submitted).

iii. *Case study / Seminar / viva*: The faculty with due approval from the department council shall choose one or more from this category, depending on the nature of subject and the mode of assessment is to be declared at the commencement of the semester. For seminar, topics outside but related to thesyllabus shall be chosen.

iv. *Attendance* :

Attendance	**% of Marks for attendance**
>=90	100
85 to 89	80
80 to 84	60
76 to 79	40
75	20

Practical : The Components of CA for practical courses except Case study I and II are as follows:

	COMPONENTS	**% OF MARKS**
i	Lab Test (Minimum one)	20%
ii	Completion of the list of Lab assignments prescribed by the faculty	20%
iii	Periodical assessment of Lab assignments through execution of programs and viva	40%
iv	Attendance (Mark distribution is same as that of theory)	20%

For Case study I and II :

	COMPONENTS	**% OF MARKS**
i	Periodical viva / short quizzes / short programming assignments to evaluate the basic knowledge/understanding of the tool.	30%
ii	Coding – Logic, Selection of appropriate constructs / features of the Tool, Style etc.	30%
iii	Execution of the case study - output	20%
iv	Viva based on case study	20%

Note :*All the records in respect of Continuous Assessment (CA) must be kept in the department and must be made available for verification by university. The results of the CA shall be displayed on the notice board within 5 working days from the last day of a semester. It should be get signed by the candidates. The marks awarded for various components of the CA shall not be rounded* *off, if it has a decimal part. The total marks of the CA shall be rounded off to the nearest whole number.*

END SEMESTER EVALUATION (ESE):

There shall be double valuation system of answer books. The average of two valuations shall be taken in to account. If there is a variation of more than 10% of the maximum marks, the answer books shall be valued by a third examiner. The final marks to be awarded shall be the average of the nearest two out of three awarded by the examiners. After that there shall be no provision for revaluation

Pattern of questions: Questions shall be set to assess knowledge acquired, standard application of knowledge, application of knowledge in new situations, critical evaluation of knowledge and the ability to synthesize knowledge. Question paper for end semester theory examination shall consist of:

i. Short answer type : 12 questions of which 10 to be answered. 10 x 3 = 30 marks,
ii. Essay type: 5 questions (one either –or question from each module) x 10 marks = 50 marks

End Semester Evaluation in Practical courses shall be conducted and evaluated by two examiners- one internal and one external. Details of scheme of evaluation of ESE practical courses are given along with respective syllabus.

3.4 Project: A project work has to be undertaken by all students. The project can be software development following all or some of the software development lifecycle or an R&D project. The hours allotted for project work may be clustered into a single slot so that students can do their work at a centre or location for a continuous period of time. The Major project work should be carried out in the Department /Institution or in alevel Industry / R & D organization of national repute. Project work shall be carried out under the supervision of a Teacher. If the project is carried out in an Industry / R & D organization outside the campus, then a co-guide shall be selected from the concerned organization. If the project work is of interdisciplinary in nature, a co-guide shall be taken from the other department concerned. Every student should do the Project individually and no grouping is allowed. All the candidates are required to get the approval of their synopsis and the guide before commencement of the project from the Department. A co-guide should be a postgraduate in CS or allied subject or a person of eminence in the area in which student has chosen the project. At the end of the semester the candidate shall submit the Project report (two bound copies and one soft copy) duly approved by the guide and co-guide for End Semester Evaluation. The project report shall be prepared according to the guidelines approved by the University.

Evaluation of Project:

i. A Departmental committee duly constituted by the Head of the Department will review the project periodically.

ii. **Continuous Assessment of project work**: There shall be three internal presentations before the committee (Minimum two members, including the guide). The assessment is based on presentation, interim report and viva voce. The total mark for CA shall be divided among the three presentations in the ratio 20%:30%:50%.Each internal presentation shall be evaluated based on the following components:

Component	% of marks
Understanding of the problem / concepts	25
Adhering to methodology.	20
Quality of presentation and demonstration (Demonstration is optional)	15
Quantum of work / effort	30
Organization and content of mid-term report	10

iii. **End Semester Assessment of Project**: A board of two examiners appointed by the University shall conduct ESE evaluation. The evaluation shall be based on the report, presentation of the work, demonstration of the work (optional) and a detailed viva voce based on the work carried out. A candidate will not be permitted to attend the Project evaluation without duly certified project reports. Also a project will be evaluated only if the candidate attend the ESE presentation and Viva voce on the scheduled date and time. A board shall evaluate a maximum of 10 candidates in a day. The ESE evaluation shall consist of the following components:

Component	% of marks
Understanding of the problem/requirements/ concepts related to the project	15
Adhering to methodology (Software engineering phases or research methodology) and the candidates understanding of the components of methodology	15
Quality of Modeling of the problem and solution/ database design / form design / reports / testing (For research projects - relevance /novelty of the work(s)/ use of data/ proposal of new models /analysis of algorithms/ comparison and analysis of results /findings)	20
Quality of presentation / demonstration	15
Quantum of work / effort - assessed through the content of report, presentation and viva.	25
Organization and content of report	10

iv. A student shall be declared to pass in the Project report course if she/he secures minimum 40 % marks of the aggregate and 40% separately for external.

v. If a candidate fail in the evaluation of Project, he/she has to repeat the project course along with the next batch and undergo both CA and ESE. *Unlike theory/practical courses, the CA mark will not retained.*

vi. There shall be no improvement chance for the marks obtained in the Project course.

3.5 Seminar: Each student shall select a relevant topic, prepare a seminar report and give a presentation (30 to 45 minutes),under the guidance of a faculty member. The evaluation of seminar is 100% internal and components and mode of evaluation shall be formulated by the department council (May include components like content, Presentation, interaction and structure of report).

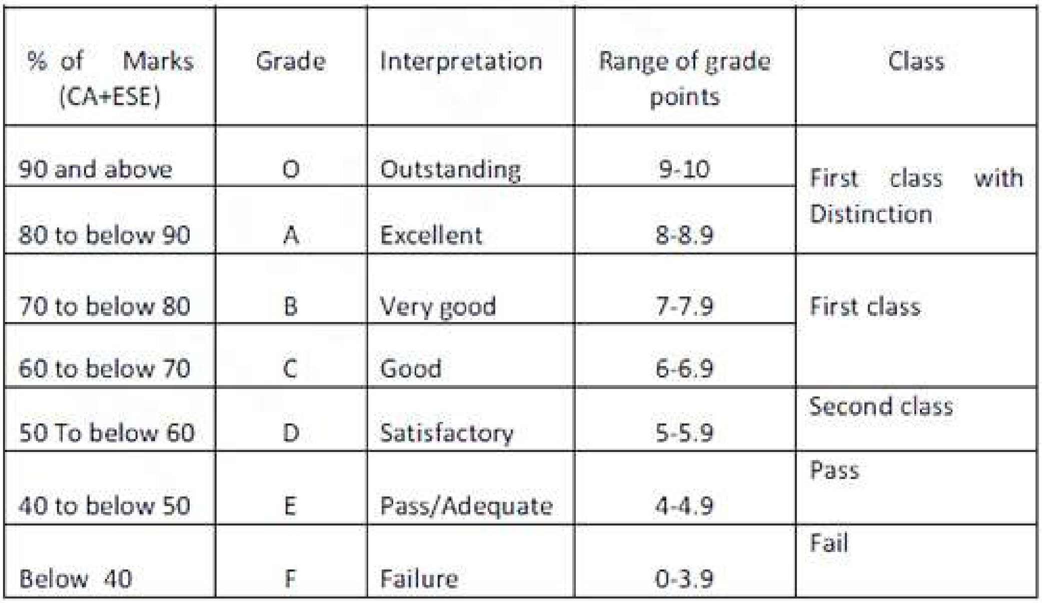
3.6 VIVA VOCE: A general Viva Voce covering all courses in the Programme shall be conducted in the fourth semester. The Viva voce shall be conducted by two external examiners. The Viva voce *shall not be clubbed* with the project evaluation. The details of the mode of conduct and evaluation of Viva Voce shall be decided by the BOE.

4. **GRADING SYSTEM**

Seven Point Indirect Relative grading system:

Evaluation(both internal and external) is carried out using Mark system .The grading on the basis of a total internal and external marks will be indicated for each course and for each semester and for the entire programme.

The guidelines of grading is as follows-



% of Marks (CA+ESE)	Grade	Interpretation	Range of grade points	Class
90 and above	O	Outstanding	9-10	First class with Distinction
80 to below 90	A	Excellent	8-8.9	
70 to below 80	B	Very good	7-7.9	First class
60 to below 70	C	Good	6-6.9	
50 To below 60	D	Satisfactory	5-5.9	Second class
40 to below 50	E	Pass/Adequate	4-4.9	Pass
Below 40	F	Failure	0-3.9	Fail

$$\text{S.G.P.A} = \frac{\text{SUM OF CREDIT POINTS OF ALL COURSES IN THE SEMESTER}}{\text{TOTAL CREDITS IN THAT SEMESTER}}$$

CREDIT POINT = GRADE POINT (G) X CREDIT (C)

$$\text{C.G.P.A} = \frac{\text{Sum of credit points of all completed semesters}}{\text{Total credits acquired}}$$

$$\mathbf{OGPA} = \frac{\textbf{Sum of } \boldsymbol{credit\ points} \textbf{ obtained in four } \boldsymbol{semesters}}{\boldsymbol{Total\ credits}\ \mathbf{(80)}}$$

PASS REQUIREMENT:

COURSE:

A CANDIDATE SECURING E GRADE WITH 40% OF AGGREGATE MARKS AND 40% SEPARATELY FOR ESE FOR EACH COURSE SHALL BE DECLARED TO HAVE PASSED IN THAT COURSE.

SEMESTER

Those who secure not less than 40 % marks (both ESE and CA put together) for all the courses of a semester shall be declared to have successfully completed the semester.

The marks obtained by the candidates for CA in the first appearance shall be retained (irrespective of pass or fail)

The candidates who fail in theory unit shall reappear for theory unit only, and the marks secured by them in practical unit, if passed in practical, will be retained.

A candidate who fails to secure a minimum for a pass in a course will be permitted to write the same examination along with the next batch.

For the successful completion of a semester, a candidate should pass all courses and secure a minimum SGPA of 4. However a student is permitted to move to the next semester irrespective of his/her SGPA. A student will be permitted to secure a minimum SGPA of 4.00 required for the successful completion of a Semester or to improve his results at ESE of any semester, by reappearing for the ESE of any course of the semester concerned, along with the examinations conducted for the subsequent admission

IMPROVEMENT:

A candidate who secures minimum marks (40 %) for a pass in a course will be permitted to write the same examination along with the next batch if he/she desires to improve his/her performance in ESE. If the candidate fails to appear for the improvement examination after registration, or if there is no change/up gradation in the marks after availing the improvement chance, the marks obtained in the first appearance shall be retained. There shall be no improvement chance for the marks obtained in internal assessment. Improvement of a particular semester can be done only once. The student shall avail the improvement chance in the succeeding year along with the subsequent batch.

There will be no supplementary examinations. For re-appearance/ improvement student can appear along with the next batch.

KANNUR UNIVERSITY
M Sc COMPUTER SCIENCE
Course Structure and Scheme of Evaluation (From 2014 Admission)
(CBSS- For affiliated Colleges)

CREDIT DISTRIBUTION

Semester	**Core**	**Elective**	**Practical**	**Project**	**Total**
1	**17**	**0**	**3**	**0**	**20**
2	**16**	**0**	**5**	**0**	**21**
3	**13**	**3**	**5**	**0**	**21**
4	**2**	**9**	**0**	**7**	**18**
Total	**48**	**12**	**13**	**7**	**80**

COURSE STRUCTURE

SEMESTER 1

Course Code	**Course title**	***Instructional Hrs/week***			MARKS			Credit
		L	P	T	CA	ESA	TOTAL	
MCS1C01	Discrete Mathematics	3	0	1	20	80	100	3
MCS1C02	Computer Organization and Architecture	3	0	1	20	80	100	3
MCS1C03	Digital Systems and Microprocessors	4	0	0	20	80	100	4
MCS1C04	Operating Systems	3	0	1	20	80	100	3
MCS1C05	Introduction to Programming	4	0	0	20	80	100	4
MCS1P01	Lab – I (IP/OS)	0	8	2	20	80	100	3
Total		17	8	5	**120**	**480**	**600**	**20**

SEMESTER 2

Course Code	**Course title**	***Instructional Hrs/week***			MARKS			Credit
		L	P	T	CA	ESA	TOTAL	
MCS2C06	Java Programming	3	0	0	20	80	100	3
MCS2C07	Data Structures& Algorithms	3	0	0	20	80	100	3
MCS2C08	Database Management Systems	3	0	0	20	80	100	3
MCS2C09	Computer Networks	3	0	0	20	80	100	3
MCS2C10	Formal Languages and Finite Automata	3	0	0	20	80	100	3
MCS2P02	Lab – II (Java/DS/DBMS)	0	7	1	20	80	100	3
MCS2P03	Case Study I	0	3	2	10	40	50	2
MCS2C11	Seminar	0	0	2	50	0	50	1
Total		15	10	5	**180**	**520**	**700**	**21**

SEMESTER 3

	Course Code	**Course title**	***Instructional Hrs/week***			MARKS			Credit
			L	P	T	CA	ESA	TOTAL	
	MCS3C12	Computer Graphics	3	0	0	20	80	100	3
	MCS3C13	System Programming & Compiler Design	3	0	0	20	80	100	3
	MCS3C14	System Administration and Network Programming	3	0	0	20	80	100	3
	MCS3C15	Software Engineering	3	0	0	20	80	100	3
	MCS3C16	Research methodology	1	0	1	50	0	50	1
ELECTIVE I	MCS3E01	Digital Signal Processing	3	0	0	20	80	100	3
	MCS3E02	Probability and Statistics							
	MCS3E03	Fuzzy Systems							
	MCS3E04	Design and Analysis of Algorithms							
	MCS3E05	Information Security							
	MCS3P04	Lab – III (CG /NP&A/SP&CD)	0	6	2	20	80	100	3
	MCS3P05	Case study II	0	3	2	10	40	50	2
	Total		16	9	5	**180**	**520**	**700**	**21**

SEMESTER 4

Course Code		**Course title**	***Instructional Hrs/week***			MARKS			Credit
			L	P	T	CA	ESA	TOTAL	
ELECTIVE 2	MCS4E06	Digital Image Processing	3	0	0	20	80	100	3
	MCS4E07	Digital Speech Processing							
	MCS4E08	Operations Research							
	MCS4E09	Linux Kernel							
	MCS4E10	Simulation and Modeling							
ELECTIVE 3	MCS4E11	Mobile Computing	3	0	0	20	80	100	3
	MCS4E12	Pattern Recognition							
	MCS4E13	Artificial Neural Networks							
	MCS4E14	High Performance Computing							
	MCS4E15	Visual Cryptography							
ELECTIVE 4	MCS4E16	Linux Device Drivers	3	0	0	20	80	100	3
	MCS4E17	Data Mining							
	MCS4E18	Natural Language Processing							
	MCS4E19	Cyber Forensic							
	MCS4E20	Artificial Intelligence							
MCS3Pr04		Project	0	16	5	20	80	100	7
MCS4C17		General Viva Voce	-	-	-	-	100	100	2
Total			9	16	5	**80**	**420**	**500**	**18**

SYLLABUS
CORE COURSES
(Theory)

MCS1C01 DISCRETE MATHEMATICS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Propositional logic – Propositions, truth tables, converse, contra positive and inverse, compound statements and their truth tables, translating natural language sentences to logical statements, tautology, contradiction, logical equivalence, De Morgan's laws, normal forms.

Predicate logic – predicates, universal and existential quantifiers, binding variables, translating natural language sentences to logical statements.

Unit 2

Sets, representation of sets, set operations, Cartesian product, using set notation with quantifiers, truth sets of quantifiers, computer representation of sets.Functions – one-to-one and onto functions, inverse functions and compositions of functions.

Unit 3

Relations – properties, functions as relations, relations on a set, combining relations, n-ary relations and their applications, representing relations, closures of relations, Warshall's algorithm, equivalence relations, equivalence classes and partitions.

Unit 4

Basics of counting, basic counting principles, the inclusion-exclusion principle, the pigeonhole principle, the generalized pigeonhole principle, permutations and combinations, with and without repetitions.Generating permutations and combinations.Recurrence relations, modeling with recurring relations.

Unit 5

Graphs – definition, different types of graphs, graph models, basic terminology, representing graphs, isomorphism, connectivity, Euler and Hamilton paths, shortest path problem and Dijkstra's algorithm.

Trees - basic terminology, properties (no proofs), spanning trees, depth-first and breadth-first searches.

Reference books:

1. Kenneth H. Rosen, Discrete Mathematics and Applications, TMH 2003
2. J.P. Tremblay and R Manohar Discrete Mathematical Structure with Applications to Computer Science, TMH 2001.
3. John Truss, Discrete Mathematics for Computer Scientists, Pearson Edn 2002
4. Sengadir, Discrete Mathematics, Pearson, 2009

MCS1C02 COMPUTER ORGANIZATION AND ARCHITECTURE

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Basic structure :Basic operational concepts. Number representation and arithmetic operations.Character representations.Performance.

Instruction set Architecture:Memory locations and addresses, memory operations, instructions and instruction sequencing, addressing modes. Assembly language, stacks, subroutines, RISC vs CISC.

Unit 2

Basic I/O: Accessing I/O devices (device interface, program controlled I/O), Interrupts (enabling and disabling, handling multiple interrupts, controlling I/O device behavior, Processor control registers, exceptions).

I/O organization: Bus structure, bus operation, arbitration, Interface circuits, interconnection standards (USB, PCI, Firewire, SCSI, SATA).

Unit 3

Basic Processing Unit : Fundamental concepts, Instruction execution, Hardware components, Instruction fetch and execution steps, control signals, Hardwired control, CICS style processors (3-bus organization, microprogrammed control).

Arithmetic - multiplication of unsigned numbers (array and sequential multipliers), multiplication of signed numbers (Booth algorithm), Fast multiplication (bit pair recoding), Floating point numbers and operations.

Unit 4

Memory system : Basic concepts, Semiconductor RAMS, ROMs, DMA, Memory hierarchy, Cache memory, performance requirements, virtual memory, memory management requirements, secondary storage devices.

Unit 5

Pipelining: basic concepts, pipeline organization, issues, data dependencies, memory delays, branch delays, performance evaluation, superscalar operations.

Parallel processing: Hardware multithreading, Vector processing, Shared memory multiprocessors, message passing multi-computers.

Text book:

1. Hamacher, Vranesic, Zaky, Manjikian, Computer Organization and Embedded Systems, 6th edn, Tata McGraw Hill.

Reference books:

1. William Stallings, Computer Organization & Architecture – Designing for Performance, 9th Edn, Pearson
2. John P. Hayes, Computer Architecture and Organization, Third Edn, Tata McGraw Hill.
3. M. Morris Mano, Computer System Architecture, PHI 2003

MCS1C03 DIGITAL SYSTEMS & MICROPROCESSORS

Contact Hours/ week: 4 **Credit: 4**

Unit 1.

Gates, Boolean algebra & Laws, Combinational Circuits : SOP, POS, K-Map Simplification (up to 6 variables), Tabular method, Decoders, Multiplexer, De-multiplexer, Encoder, Adders: Half Adder, Full Adder, Cascading Full-Adders, Look-Ahead Carry, Logic Families: RTL, DTL, I^2L, TTL, ECL, MOS, FETs, MOSFETs, CMOS..

Unit 2

Sequential circuits: Flip-flops: SR, JK, D, Master-Slave, Edge-Triggered, T flip- flops Registers: Registers with parallel load, Shift Registers, Bidirectional Shift Registers with parallel load, Tristate Registers, Counters: Design, Simple Counters(Divide by 2,4 and 8, Johnson Counter, Ring Counter), Ripple Counters, Synchronous Counters.

Unit 3

Microprocessors: Architecture of 8085, Block Diagram and pin outs, Instruction set, Addressing modes, Subroutines, Interrupts, Peripheral Interfacing.8255A Programmable peripheral interfacing: 8254 programmable interval timer, 8237 DMA Controller, 8279 Keyboard/Display Controller.

Unit 4

Advanced Microprocessors: Architecture of 8086, Additional features of 8086: Pin diagrams, Timing Diagrams, Addressing Modes, Memory organization – segment-offset addressing, , Min-Max mode, Stack structure, Interrupts.

Unit 5

Special Features of advanced processors 386,486 and Pentium: Memory System, I/O System, Timing, Registers, Memory Management. 386: Moving to protected mode, Virtual mode, Memory paging mechanism. Pentium: Extensions- Introduction.

Reference Books

1. John . M. Yarbrough , Digital Logic Applications and Design,Thomson -2002 .
2. M. Moris Mano, Digital Design – PHI 2001
3. R. Gaonkar, Microprocessor Architecture and Programming.TMH-2002.
4. Bary B. Brey, The Intel microprocessors , PHI 2003

MCS1C04 OPERATING SYSTEMS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction – Mainframe systems, Desktop systems, Multiprocessor systems, Distributed systems, Clustered systems, Real time systems, Hand held systems, Computing environments. **Computer System structures** – Computer system operation, I / O Structure, Storage structure, Storage hierarchy, Network structures. **Operating system structures** - System components, Operating systems services, System calls, System programs, System structure, Virtual machine, System design and implementation.

Unit 2

Processes – Process concepts, Process scheduling, Operations on Process, Cooperating Process, Inter Process communication in Client/ Server system. **Threads**- Multi threading models, Threading issues, Pthreads, Linux and Java Threads. **CPU Scheduling** – Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple processor Scheduling, Real time Scheduling, Algorithm evaluation, Process Scheduling models. **Process Synchronization** – Critical section problem, Synchronization hardware, Semaphores, Classic problems of synchronization, Critical region, Monitors, OS Synchronization, Atomic transaction.**Deadlocks** – System models, Deadlocks characterization, Method for handling Deadlocks, Deadlock prevention, Deadlock avoidances, Deadlock detection, Recovery from Deadlocks.

Unit 3

Memory management- swapping, Contiguous memory allocation, Paging Segmentation, Segmentation with paging.**Virtual memory**- Demand paging, processes creation, page replacement, allocation of frames, thrashing. **File system interface and Implementation**- File concepts, access methods, directory structure, File system mounting, File sharing, Protection, File system structure, File system implementation, Directory implementation, Allocation methods, Free space managements, Efficiency and performance, Recovery , Log- structured file system, NFS.

Unit 4

I / O Systems - I / O hardware, Application I/O interface, Kernel I / O subsystem, Transforming I / O to hardware operations, STREAMS, Performances. **Mass storage structure** - Disk structure, Disk scheduling, Disk management, Swap space managements, RAID structure, Disk attachments, Stable storage implementation, Tertiary storage structure.

Unit 5

Distributed Systems – Motivation, Types of Distributed Operating systems.**Distributed file systems** – Background, Naming and transparency, Remote file access, Stateful versus stateless service, File replication. **Protection**- Goals and principlesof protection, Domain of protection, Access matrix, Access control, Revocation of access rights, Capability based systems (Hydra), Language based protection(protection in java). **Security**- The security problem, Program threats, System and network threats.

Text Book:

1. Silberschatz, A., Galvin, P.B. & Gagne, G. “Operating System Concepts”, 6th Ed. Wiley-India.

References:

1. Dhamdhere, D. M. “Operating Systems”, 2nd Ed. The McGraw - Hill Companies.
2. Kochan, S, G., Wood, P., “Unix shell programming”, 3rd ed. Pearson Education, 2003
3. Ditel, Deital and Choffness, Operating Systems, Pearson, 3rdEdn

MCS1C05 INTRODUCTION TO PROGRAMMING

Contact Hours/ week :4 **Credit : 4**

Unit 1

Introduction to „ C‟‟ programming –fundamentals – structure of a C program – compilation and linking processes – Constants, Variables – Data Types – Expressions using operators in C – Managing Input and Output operations – Decision Making and Branching – Looping.
Arrays – Initialization – Declaration – One dimensional and Two dimensional arrays. String- String operations – String Arrays.Simple programs- sorting- searching – matrix operations.

Unit 2

Function – definition of function – Declaration of function – Pass by value – Pass by reference – Recursion. Pointers - Definition – Initialization – Pointers arithmetic – Pointers and arrays- Structure definition – Structure declaration – Structure within a structure - Union - Example programs.Storage classes, Pre-processor directives.

Unit 3

Introduction to OOP – overview of C++,Class, Object, inline functions, constructors, destructors, scope resolution operator, friend functions, friend classes, static members, *this* pointer, references, dynamic memory allocation.

Unit 4

Function overloading, overloading constructors, pointers to functions Operator overloading.
Inheritance, types of inheritance, protected members, virtual base class, polymorphism, virtual functions, pure virtual functions.

Unit5

Streams, formatting I /O with class functions and manipulators, overloading << and >> , File I/ O , name spaces, conversion functions, array based I /O, Standard Template Library (STL), Class templates and generic classes, function templates and generic functions.

References:

1. Kernighan,B.W and Ritchie,D.M, "The C Programming language", 2nd Edn, Pearson Education, 2006
2. Balagurusamy, Programming in ANSI C, 5th edn, TMH.
3. Byron Gorrfried, Programming with C, 3rd Edn, Schaum's outline.
4. Schildt, C++ - The complete Reference, 4th edn, McGraw Hill.
5. Somashekara, Guru, Nagendrasamy, Majunath, object Oriented Programming with C++, 2nd edn PHI
6. BjarneStroustrup - The C++ Programming language, Addison Wesley , 3rd Ed.

MCS2C06 JAVA PROGRAMMING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Object oriented programming, basic concepts of OOP; Introduction to Java programming, features of Java: - Bytecode, Java Virtual Machine (JVM), Java Applets and Applications, Java file name and directory structure; Packages of Java API. Data Types, Variables, and Arrays, Type Conversion and Casting; Operators; Control Statements.

Unit 2

Class, Class Fundamentals, Declaring Objects, Constructors, access specifier, static, Nested and Inner Classes, Command-Line Arguments, this Keyword; Garbage Collection.String handling. Collection class.
Inheritance, method overloading, Method Overriding, Dynamic Method Dispatch, Abstract Classes.

Unit 3

Packages, Importing Packages; Interface: Defining an Interface, Implementing Interfaces; Exception Handling: try, catch, throw, throws, and finally, Java's Built-in Exceptions; Thread, Synchronization, Messaging, Runnable interface, Inter thread communication, Deadlock, Suspending, Resuming and stopping threads, Multithreading. I/O streams, File streams.

Unit 4

Applets: Applet lifecycle, working with Applets, The HTML APPLET tag. Working with Graphics. Abstract Window Toolkit (AWT): AWT Classes, Window Fundamentals, Component, Container, Panel, Window, Frame. working with Frame Windows, AWT Controls, Layout Managers, and Menus.

Unit 5

Event Handling: Events, Event Sources, Event Classes, Event Listener Interfaces, Adapter Classes.

Java database connectivity:-jdbc architecture- drivers- database connections- statements-resultsets- transactions-metadata-stored procedures-error handling- blobs and clobs.

Reference books:

1. Herbert Schildt, The complete reference Java2 ,7thed, Mc, Graw Hill.
2. David Flanagan, Java in a Nutshell A desktop quick Reference, 2 Edition, OReilly&Associates, Inc
3. Java programming, Rajkumar, pearson, 2013
4. Java Programming, HarimohanPandey, Pearson, 2012
5. Core Java for beginners, sha and sha, ShroffPubl and dist, 2010
6. Object Oriented Programming through Java, Rasdhakrishnan, University Press, 2007
7. Java for Programmers, 2ndEdn, Deital and Deital, Person

MCS2C07 DATA STRUCTURES & ALGORITHMS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Abstract Data Types (ADT), Algorithm analysis, Asymptotic notations.

Arrays – representation. Polynomials with arrays – operations – addition and evaluation.Sparse matrix representation with arrays – operations- transpose and addition.

Linked list – Singly linked list (SLL) – basic operations (create list, add/delete nodes, traverse/print, search SLL, concatenate, merge two sorted SLLs, recursive function for reversing a SLL). Circular SLL – operations (add/delete nodes, print, concatenate, search). LL with header/trailer nodes. Doubly Linked List – basic operations (create list, add/delete nodes, traverse/print). Polynomials with SLL – addition and evaluation.

Unit2

Stack – array and Linked List implementation – applications – infix to postfix conversion – evaluation of postfix. Queue – array and Linked implementation – circular array Queue – Priority Queue – implementation with array and LL. Application of queues.

Non-linear data structures – tree and binary tree– basic definitions and properties –function to create binary tree - traversal – recursive and non-recursive, Print/traverse data level by level, count number of nodes.

Unit3

Threaded binary tree(TBT) – inorder threaded BT and function for inorder traversal of Inorder TBT. Binary search tree – create - add/delete nodes – search. Applications of trees.

AVL trees –B-Trees – Red-black trees (Basic ideas only).

Hashing - Hashing functions - Collision Resolution Techniques - Separate chaining - Open addressing – Multiple hashing.

Unit 4

Graph - Definitions – Representation of graph - Graph Traversals - Depth-first traversal – breadth-first traversal - applications of graphs – shortest-path algorithm – Dijkstra's algorithm -minimum spanning tree – Prim's and Kruskal's algorithms.

Unit 5

Sorting – Insertion,Quick and Heap.

Algorithms - Divide and Conquer – Merge Sort – Binary Search - Greedy Algorithms – Knapsack Problem – Dynamic Programming – Warshal's Algorithm for Finding Transitive Closure – Backtracking – Sum of Subset Problem.

Reference Books:

1. Horowitz, Sahni and Mehta, Fundamentals of Data Structures in C++, 2ndEdn, University Press
2. Horowitz, Sahni, Rajasekaran, Fundamentals of Algorithms, 2ndEdn, University Press
3. M. A. Weis, Data Structures and Algorithm Analysis in C++, Pearson Education Asia, 2013
4. Langsam, Augenstein and Tenenbaum, Data Structures Using C and C++, 2ndedn, PHI.
5. Anany Leviton, Introduction to the Design and Analysis of Algorithms, 3rd Edition, Pearson Education.
6. Aho, Hopcroft and Ullman, Data Structures and Algorithms, Pearson Education.

MCS2C08 DATABASE MANAGEMENT SYSTEMS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Database concepts, Relational database : Introduction to Relational model , relational algebra, views, tuple relational calculus, domain relational calculus, SQL- basic structure, set operations, sub queries, joint relation, DDL, DML, embedded SQL, QBE. Formal relational query language.

Unit 2

Database design : ER model basic concepts, constraints, Keys, ER diagram, Reduction of ER schema, UML, design of an ER database schema. Relational database design - 1st, 2nd, 3rd, 4th, BCNF, 5th Normal forms. Integrity and security, domain constraints, referential integrity, assertion, triggers, authorization in SQL, relational database design

Unit 3

Data storage and querying – storage and file structures, Indexing and hashing, basic concepts, static hashing, dynamic hashing, multiple key accesses, Query processing- Query optimization Transaction Management-Transaction concepts, transaction definition in SQL. Concurrency control, Recovery systems, deadlock handling.

Unit 4

Database system Architecture, Parallel databases, distributed databases, Data warehousing and mining- object based databases

Unit 5

Case study : PostgreSQL – data type – tables – psql – operations on tables – sub queries – views - operators & functions –indices – arrays – transactions and cursors, PostgreSQL Administration – authentication and Encryption – Database management – User and group management – PostgreSQL programming – Pl/pgSQL.

Reference Books

1. Silbersehatz, Korth and Sudarshan, Database system concepts, 6th edition MGH 2011
2. Ramakrishnan and Gehrke, Database Management Systems, 3rd Edn, McGraw Hill, 2003
3. A Leon & M Leon, Database Management Systems , Leon Vikas – 2003.
4. Elmasri and Navathe, Fundementals of Database systems, 5thEdition ,Pearson 2009
5. O'Reilly, Practical PostgreSQLShroffPublishers(SPD) 2002

MCS2C09 COMPUTER NETWORKS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction, network hardware, software, Reference Model,Internet, ATM, Physical Layer, Transmission Media, Wireless transmission, Switching – circuit switching, packet switching, message switching and hybrid switching - Communication Satellites.

Unit 2

Data Link Layer design issues, Error detection & correction, Elementary data link protocols, Sliding Window protocols, Data Link Layer in the Internet.

Unit 3

Medium access layer, Channel allocation problem, Multiple access protocols, Ethernet, Wireless LAN, Bluetooth.

Unit 4

Network Layer, Design Issues, Routing Algorithms, Congestion Control Algorithm, Internetworking, Internet Protocol, IP Address, Internet Control Protocol.

Unit5

Transport Layer, Design Issues, Connection Management – addressing, establishing and releasing a connection, Simple Transport Protocol, Internet Transport Protocol, E-mail, Network Security, Cryptography.

Text book

1. Andrews S. Tanenbaum. "Computer Networks", 4th Edition, Prentice Hall of India, 2006.

References Books

1. Behrouz A Forouzan. "Data Communications and Networking", 4th Edition, McGraw Hill, India, 2011.
2. William Stallings. "Data and Computer communications", 7th Edition, Prentice Hall of India, 2004.
3. Kruse and Ross, Computer Networking, , 5thedn, Pearson

MCS2C10 FORMAL LANGUAGES AND FINITE AUTOMATA

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction to the Theory of computation and Finite Automata: Mathematical preliminaries and notation, Proof techniques, Three basic concepts: languages, grammar & automata. Some applications.

Finite automata: Deterministic Finite Acceptors, Nondeterministic Finite Acceptors, Equivalence of deterministic and nondeterministic finite acceptors, Reduction of the number of states in finite automata.

Unit 2

Regular Languages and Regular grammars :Regular expressions, connection between regular expressions and regular languages , regular grammars

Properties of Regular Languages:closure properties of regular languages, identifying non regular language.

Context-free grammars & languages Context-free grammars, parsing and ambiguity.

Unit 3

Simplification of Context free Grammars and Normal forms : methods of transforming grammars, two important normal forms.

Pushdown automata for context-free languages Non deterministic pushdown automata, PDA and context-free languages, deterministic pushdown automata and deterministic context-free languages.

Unit 4

Properties of Context-Free Languages: pumping lemmas for context free languages and linear languages, closure properties for context-free languages.

Turing machine Standard Turing machine, combining Turing machines for complicated tasks, Turing's thesis

Unit 5

Other models of Turingmachine : Minor variations on the Turing machine theme, Turing machine with complex storage, nondeterministic Turing machine, a universal Turing machine, Linear bounded automata.

Limits of Algorithmic computation: Problems that cannot be solved by Turing machines, Undecidable Problems for Recursively enumerable Languages, The Post Correspondence problem.

Text Book :

1. An introduction to Formal Languages and Automata, Peter Linz, 4thedn, Narosa publishing House.

Reference Books

1. John C Martin, Introduction to Languages and the Theory of Automata, McGraw Hill 1997
2. Mishra &Chandrasekharan, Theory of Computer Science : Automata, Languages and Computation, 3rd edn, PHI
3. Hopcroft, Motwani and Ullman, Introduction to automata theory, Languages and Computation, 3rdEdn,., Pearson

MCS3C12 COMPUTER GRAPHICS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Overview of Graphics systems: Video display devices, Raster scan systems, Graphic workstations and viewing systems, Input devices, Graphics software, introduction to OpenGL.

Graphics Output Primitives:Coordinate reference frames, Line drawing algorithms (DDA and Bresenham's), OpenGL curve functions, Circle generating algorithms (Midpoint circle), Pixel addressing and Object geometry, fill area primitives, Polygon fill areas.

Unit 2

Attributes of graphics primitives : Color and Gray scale, point attributes, Line attributes, Fill-Area attributes, General Scan-line polygon fill algorithm, Scan-Line fill of convex-polygons, Boundary fill and flood fill algorithms, Antialiasing.

Two-dimensional viewing : 2D viewing pipeline, Clipping window, normalization and viewport transformation, Clipping algorithms, point clipping, line clipping (Cohen-Sutherland, Nichol-Lee-Nichol), Polygon Fill-area clipping (Sutherland – Hodgeman).

Unit 3

Geometric Transformations: Basic 2D transformation, Matrix representation and Homogeneous coordinates, Inverse transformations, 2D composite transformations, Reflection and shear, Raster methods for geometric transformations, Transformations between 2D coordinate systems.3D Geometric transformations, 3D translation, 3D rotation (coordinate axis rotation, General 3-d rotation, Quaternion methods for 3D rotation), 3D scaling, 3D composite transformations, transformations between 3D coordinate systems.

Unit 4

Three-dimensional viewing : Overview of 3D viewing concepts, 3D viewing pipeline, 3D viewing coordinate parameters, Transformation from world to viewing coordinates, Projection transformations, orthogonal projections (axonometric and isometric, orthogonal projection coordinates, clipping window and orthogonal projection view volume, Normalization transformation), Oblique parallel projections (Cavalier and cabinet projections, Clipping window and Oblique parallel-projection view volume, Oblique parallel projection transformation matrix, normalization transformation), Perspective projections (transformation coordinates, perspective-projection equations, vanishing points, view volume, transformation matrix, symmetric and oblique perspective-projection frustum, Normalized perspective-projection transformation coordinates), 3D clipping algorithms (region codes, point and line clipping, polygon clipping)..

Unit5

3D Object representation : Quadric surfaces, superquadrics, blobby objects, spline representations.

Visible surface detection methods : Classification, Back-face detection, depth-Buffer method, A-buffer method. Wireframe visibility methods.

Illumination models and surface rendering methods : Light sources, Surface lighting effects, Basic illumination models (Ambient light, Diffuse reflection, Specular reflection and the Phong model), polygon rendering methods (constant intensity surface rendering, Gouraud surface rendering, Phong surface rendering), Ray tracing methods – basic Ray-tracing algorithm.

Text Book :

1. Hearn and Baker, Computer Graphics with OpenGL, 3rdedn, Pearson.

Reference Books:

1. Hill Jr. and Kelly, Computer Graphics using OpenGL, 3rdEdn, Pearson
2. Shreiner, Sellers, Kessenich, Licea-Kane, OpenGL programming guide, 8thedn, Pearson.
3. Foley, Van Dam, Feiner, Hughes, Computer Graphics- Principles and practice, Second Edition in C, Pearson Education.

MCS3C13 SYSTEMS PROGRAMMING & COMPILER DESIGN

Contact Hours/ week : 3 **Credit : 3**

Unit l

Assemblers: Elements of Assembly Language Programming, Overview of Assembly Process, Design of Two pass Assembler, Macros and Macro Processors, Macro definition, call and expansion, Nested Macro calls, Advanced Macro facilities, Design of Macro preprocessor.

Unit 2

Linkers: Linking and Relocation concepts, Design of linkers, Self relocating programs, Linking for over-lays, Loaders. Introduction to compilers: Different Phases. Lexical Analysis:role of the lexical analyzer, input buffering, specification of tokens, Recognition of tokens, lexical Analyzer generators, Lex.

Unit 3

Syntax Analysis: role of the parser Context free grammar, writing a grammar, Top down parsing, Recursive descent parsing, Predictive parsing. Bottom Up Parsing, Shift Reduce parsing, Operator precedence parsing, LR parsers (SLR, Canonical and LALR). Parser generators, Yacc.

Unit 4

Syntax-directed translation – Syntax-directed definitions: S-attributed definition, L-attributed definition. Top-down and bottom-up translation, Type checking, Type systems, Specification of a type checker. Run time Environment:source language issues, storage organization Storage organization schemes, Activation records. Storage allocation strategies, Access to non-local names. Parameter passing mechanisms.Symbol tables.

Unit 5

Intermediate code generation, intermediate languages, declaration and assignment statements. Code generation: Issues, target machine, run time storage management, Runtime storage allocation, basic blocks and flow graphs. Code optimization: Principal sources of optimization.

Text books:

1. D.M. Dhamdhree, "Systems Programming and Operating Systems", TMH, 2003.
2. A.V. Aho, R. Semi, J.D. Ullman, "Compilers - Principles, techniques and tools", Pearson Education, 2003

Reference books:

1. A.V. Aho and J.D. Ullman, " Principles of Compiler Design", Narosa, 2002
2. Kenneth.C.Louden, Compiler Construction:Principles And Practice, Thomson Learning, India
3. Dave and Dave, Compilers – principles and practice, pearson, 2012
4. Lex and Yac, o'Reilly, 2ndEdn
5. Appel, Modern Compiler Implementation in C, Cambridge , 2012

MCS3C14 SYSTEM ADMINISTRATION AND NETWORK PROGRAMMING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction:Important parts of kernel; Major services in a UNIX system: init, login from terminals, syslog, periodic command execution crown and at;***Boot process**:* The LILO boot process: LILO parameters, /etc/lilo.conf; The GRUB boot process; The /boot directory and files; initrd file and mkinitrd; Run levels: */etc/inittab, start-up script /etc/rc.d/rc.sysinit;* ***System Configuration**:* The /etc/sysconfig/… files,*kernel modules;* kernel daemon; /etc/conf. modules and module parameters; /lib/modules/… directory structure and contents.

Unit 2

File system configuration: file system types, /etc/fstabloyout and meaning; Basic user environment: /etc/skel/… and home directories, Window manager configuration file locations; ***System Security*****:** Host security: tcp_wrappers and /etc/hosts.allow and /etc/hosts. deny, /etc/security, shadow password, file permissions, users groups and umask; Adding and deleting users;***System maintenance*****:** Syslogd, klogd and /etc/syslog.conf; Using a remote syslog; The system crontab, dailyscript, tmpwatch and logrotate; Using and managing the system log files; Basic system backup and restore operations; Emergency rescue operations.

Unit 3

TCP / IP Network Configuration: Introduction to TCP / IP network, Protocols, IP address, Hostname, Configuring a Host : setting the host name, assigning IP address, broad cast, net mask and name server address, Editing Host and network files, Interface Configuration: loop back interface, Ethernet interface, The SLIP and PPP interface, Configuring Gateway, Routing through gateway, Network commands: ifconfig, netstat, route. Network applications Configuration: File Transfer Protocol (FTP) and Trivial File Transfer Protocol (TFTP), Network File Systems (NFS) . Network Information System(NIS),Hyper Text Transfer Protocol (HTTP) and Web server, Server Message Block (SMB) Protocol and Samba server, Dynamic Host configuration Protocol (DHCP) Firewalls, Remote booting.

Unit 4

Domain Name Services (DNS) and Mail services: working of DNS, Host name Resolution Name lookup with DNS, Reverse Lookup, Domain Name Servers and Zones, DNS database: SOA, NS, MX, A and PTR records, Secondary and primary DNS, Zone change notification, root servers, internet root domains, configuring DNS, Using nslookup. Simple Mail Transfer Protocol (SMTP), Post office Protocol(POP) Multipurpose Internet Mail Extension (MIME), SMTP and POP3 command, Mail routing, Configuring A mail server.

Unit 5

Inter Process Communication programming : Create a process- fork() system call, Parent and Child Process, Process ID, User and Group ID Half Duplex Unix Pipes, Named Pipes, (First In First Out) , Streams and messages, System V IPC :Message Queues, Semaphores, Shared memory, Sample programs for IPC that uses Pipes, FIFO;Socket Programming: Overview, socket address, Elementary Socket System Calls: socket, socket pair, bind, connect, listen,accept, send, sendto, recv, recvfrom, close, Byte ordering routines, Byte Operations, Address conversion routines, Simple client Programs that uses some reserved ports, Simple Client / Server Program using unreserved ports.

Reference Books

1. Evi Nemeth ., et al, Linux Administration Hand Book , PHI 2003
2. Nicholas Wells, Linux Installation and Administration, Thomson Vikas 2000.
3. Olaf Kirch& Terry Dawson, Linux Network Administrators Guide, O'relly, 2003
4. Hunt, Linux DNS server Administration, BPB Publication, 2003
5. W Richard Stevens, Unix Network Programming, PHI, 2002

MCS3C15 SOFTWARE ENGINEERING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Software and Software Engineering: Nature of software and web apps, The software process, Software Engineering practice, Software myths.

Process Models: A generic process model, Prescriptive process model, Specialized process models, The unified process, Personal and team process models, Process technology, Product and process.

Agile Development: Agility- Agility and cost of change, Agile process, Extreme programming, Other agile process models.

Unit 2

Project Management Concepts: The management spectrum, People, Product, Process, Project, W^5HH principle.

Product Metrics:A framework for product metrics, Metrics for the requirements model, Metrics for the design model, Design metrics for Web apps, Metrics for Source code, Metrics for Testing, Metrics for maintenance.

Process and project Metrics:Metrics in the process and project domains, Software measurements, Metrics for software quality.

Estimation for Software Projects:Observations on estimation, The project planning process, Software scope and feasibility, Resources, Software project estimation, Decomposition techniques, Empirical estimation models, Specialized estimation techniques.

Project scheduling: Basic concepts, Project scheduling, Defining a task set for software project, Scheduling, Earned value analysis.

Risk Management: Reactive Vs proactive risk strategies, Software risks, Risk Identification, Risk projection, Risk refinement, Risk mitigation, Monitoring, Management, The RMMM plan.

Unit 3

Quality Concepts: Software quality, Software quality dilemma, Achieving software quality.

Review Techniques: Cost impact of software defects, Defect amplification and removal, Review metrics and their use, Informal reviews, Formal technical reviews.

Software Quality Assurance: Elements of software quality assurance, SQA tasks, Goals and metrics, Formal approaches to SQA, Statistical quality assurance, Software reliability, The SQA plan.

Software Configuration Management: Software configuration management, The SCM process, Configuration management for web apps

Principles That Guide Practice: Software engineering knowledge, Core principles, Principles that guide each framework activity.

Understanding Requirements: Requirements engineering, Establishing the ground work, Eliciting requirements, Building requirements model, Negotiating requirements, Validating requirements.

Unit 4

Requirements Modeling: Flow, Behavior and Web Apps, Requirements modeling strategies, Flow oriented modeling, Creating a behavioral model, Requirements modeling for web apps.

Design Concepts: The design process, Design concepts, the design model. Software architecture, Architectural Design, Architectural mapping using dataflows.

Component Level Design: Cohesion, Coupling, Component level design for web apps, Component based development.

Use Interface Design: The golden rules, Use interface analysis and design, Interface analysis, Interface design steps, Web apps interface design, Design evaluation.

Web apps Design: Web apps design quality, Design goals, Design pyramid for web apps, Web apps interface design, Aesthetic design, Content design, Architecture design, Navigation design, Component level design.

Unit 5

Software Testing Strategies A strategic approach to software testing, strategic issues, Test strategies for conventional software, test strategies for web apps, Validation testing, system testing, The art of debugging.

Testing Conventional Applications: Software testing fundamentals, white box testing, Basis path testing, Control structure testing, Black box testing.

Testing Web Applications: Testing concepts for web apps, content testing, User interface testing, Component level testing, Navigation testing, Configuration, Performance and security testing.

Maintenance and Re Engineering: Software maintenance, Reengineering, Software reengineering, Reverse engineering, Restructuring, Forward engineering.

Text book :

1. Roger S. Pressman.Software Engineering – A practitioner's Approach, 7thEdition.,McGraw Hill,2010.

Reference Books:

2. Ian Somerville., Software Engineering., 9th Edition, Pearson , 2012.
3. Richard Fairley. , Software Engineering Concepts , TMH, 1997.
4. PankajJalote., Software Engineering - A precise Approach,Wiley India, 2011
5. Ammann and Offcut, Introduction to Software Testing, Cambridge University Press, 2008

MCS3C16 RESEARCH METHODOLOGY

Contact Hours/ week :1+1 **Credit : 1**

Unit 1

Introduction to Research Methodology : Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Significance of Research, Research Process, Creativity and innovation, Thinking skills, Critical Thinking, Productive Thinking, Experimental Skills; Problem Solving Strategies, Logical thinking, Inductive and Deductive logic. Criteria of a good research, Defining the Research Problem: Selecting the Problem, Motivation behind the Problem definition, Techniques in defining the problem.

Unit 2

Research Ethics, Plagiarism, Research Formulation: Selecting the problem, Importance of literature review in selecting a problem, Literature review, primary and secondary sources, reviews, treatise, monographs, web as a source, searching the web.

Unit 3

Critical literature review, Identifying gap areas from literature review, Development of working hypothesis. Research Design: Planning and designing experiments, Critical Analysis

Unit 4

Structure and Components of Research Report, Data Presentation, Types of Report, Layout of Research Report, Mechanism of writing a research Thesis, Formats of a research paper (Science/ Engineering/ Technology research papers), IMRAD format, IEEE/ACM Professional Societies paper formats, Reference Citing Styles.

Unit 5

Publication Process: Peer review process, Open Access publications, other emerging trends in research communications, Shodhganga, Advanced academic search skills in Internet, Google Scholar, Scopus, Impact Factor, h-Index, g- index, Copyrights and Patents, IPR Laws.

REFERENCES

1. Kothari, C.R., “Research Methodology: Methods and Techniques”, New Age Publisher, 2006.
2. Michael P. Marder, “Research Methods for Science”, Cambridge University Press, 1st Ed., 2011.
3. Donald H. McBurney, “Research Methods”, 5th Edition, Thomson Learning, 2006.
4. Ranjit Kumar, “Research Methodology: A Step-by-Step Guide for Beginners”, SAGE Publications, 3rd Ed., 2010.

SYLLABUS

ELECTIVE COURSES

MCS3E01 DIGITAL SIGNAL PROCESSING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction to discrete time signals & system – Discrete time signals and systems – Properties of discrete systems – linearity – time invariance – causality – stability – convolution – difference equation representation of discrete systems – The Z transform – properties of Z transform – the inverse Z transform – System function.

Unit 2

Discrete Fourier Transform & Fast Fourier Transform. Discrete Fourier series – properties – discrete Fourier transform – properties – block convolution – decimation in – time FFT algorithms – decimation in – frequency FFT algorithms.

Unit 3

FIR Digital Filters Realizations – direct – cascade – lattice forms – hardware implementation – FIR filter design using Fourier series – use of window functions – frequency sampling design.

Unit 4

IIR Digital Filters Realizations – Direct – Cascade – Parallel forms – hardware implementation – Analog filter approximations – Butterworth and Chebychev approximations – The method of mapping of differentials – impulse invariant transformation – Bilinear transformation – Matched Z transform technique.

Unit 5

Finite word length effects in digital filters – Fixed point arithmetic – Floating point arithmetic – Block floating point arithmetic – Truncation – Rounding – Quantization error in analog to digital conversion – finite register length effects in IIR & FIR filters Limit cycles. Digital signal processing application (Only brief description required)

Reference Books:

1. Oppenheim & Ronald W Schafer, Digital Signal Processing, Pearson
2. Andreas Antoniou , Digital Signal Processing, 1st Edn, TMH.
3. Andreas Antoniou ,"Digital Filters Analysis, Design & Applications, TMH.
4. R Rabiner & B. Gold , Theory & Application of Digital Signal processing, Prentice Hall India
5. SanjitK.Mithra , Digital Signal Processing, Tata Mc –Graw Hill
6. John G Proakis&Dimitris G Manolakis ,Digital Signal Processing , pearson
7. Kamen and Heck, Fundamentals of Signals and Systems using the Web and Matlab, 3rd edn, 2008, Pearson

MCS3E02 PROBABILITY& STATISTICS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Probability distributions : Random variables, Binomial distribution, Hyper geometric distribution, Mean and variance ofprobability distribution, Chebysheve's theorem, Poisson approximation to binomial, Poisson processes, Geometric distribution, Normal distribution, Normal approximation to Binomial distribution, Uniform distribution, Log-normaldistribution, Gamma distribution, Beta distribution, Weibull distribution.

Unit 2

Sampling distributions and Inference Concerning Means :- Population and Samples, the sampling distribution of the mean, sampling distribution of variance, Point estimation, Bayesian estimation, Tests of Hypotheses,the null Hypotheses and the significance tests, Hypotheses concerning one mean, Operating characteristic curves, Inferenceconcerning two means.

Unit 3

Inference concerning Variance and Proportions : Estimation of variances, Hypotheses concerning one variance,Hypotheses concerning two variances, Estimation of proportions, Bayesian estimation, Hypotheses concerning oneproportion, Hypotheses concerning several proportions, analysis of rxc tables, Goodness of fit.

Unit 4

Correlation and Regression analysis: Curve fitting, the method of least squares, inference based on the lest squareestimators, curvilinear regression, correlation, fisher's transformation, inference concerning correlation coefficient.

Unit 5

Analysis of variance :- General principles, Complexity randomized design, Randomized Block diagram, Multiplecomparison, Some further experimental designs, Analysis of covariance.

Reference Books:

1. Johnson, Probability and Statistics for Engineers (V Edn), Miller & Freund
2. Levin & Rubin, Statistics for Management, PHI
3. Milton & Arnold, Probabilities in engineering and Computer Sciences, MGH
4. Ross, Introduction to Probability and Statistics for engineers and Scientists, John Wiley & Sons
5. Frank &Althoen, Statistics – concepts and Applications, Cambridge University press
6. Walpole et. al., Probability and Statistics for Engineers & Scientists, 8th Edn, Pearson

MCS3E03 FUZZY SYSTEMS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction: Fuzzy systems – Historical perspective, Utility and limitations, uncertainity and information, fuzzy sets and membership, Chance vs Fuzziness.

Classica sets and Fuzzy sets: Classical set (Operations, properties, mapping to functions). Fuzzy sets 9operations, properties, Alternative fuzzy set operations).

Unit 2

Classical Relations and Fuzzy relations: Cartesian product, crisp relations (cardinality, operations, properties, composition), Fuzzy relations (cardinality, operations, properties, Fuzzy Cartesian products and composition), Tolerance and equivalence relation, Crisp equivalence and tolerance relations, Fuzzy tolerance and equivalence relations, value assignments (Cosine amplitude , Max-min method), other similarity methods, other forms of composition Operation.

Unit 3

Properties of membership functions, Fuzzification and Defuzzification: Features of the membership functions, various forms, Fuzzification, defuzzification to crisp sets, λ-cuts for fuzzy relations, Defuzzification to scalars.

Logic and Fuzzy systems: Classical logic, proof, Fuzzy logic, approximate reasoning, other forms of the implication operation. Natural language, Linguistic hedges, Fuzzy rule based systems, Graphical techniques for inference.

Unit 4

Development of membership functions: Membership value assignments (intuition, inference, rank ordering, Neural network, Genetic algorithm, inductive reasoning.)

Extension Principle: Crisp functions, mapping and relations, Functions of Fuzzy sets – extension principle, Fuzzy transform, practical considerations.

Unit 5

Fuzzy arithmetic: Interval analysis, Approximate methods of extension – DSW and restricted DSW algorithms.

Fuzzy classification: Classification by equivalence relation (crisp and Fuzzy), Cluster analysis, cluster validity, C-means clustering (Hard and Fuzzy), Fuzzy c-means algorithm.

Reference books

1. Ross, Fuzzy Logic with Engineering Applications, 3rdEdn, Wiley India.
2. Hajek P, Metamathematics of Fuzzy Logic. Kluwer, 1998
3. Rajasekharan and Viajayalakshmipai, Neural Networks, Fuzzy Logic and Genetic Algorithm, PHI, 2003.
4. Sivanandan and Deepa, Principles of Soft Computing, John wiley and Sons, 2007.

MCS3E04 DESIGN AND ANALYSIS OF ALGORITHMS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction, recursive algorithms, time and space complexities, randomized algorithms, repeated element, primalitytesting.

Divide and conquer- general method, finding maximum and minimum, merge sort, quick sort, selection, Strassen's matrixmultiplication, convex hull algorithm.

Unit 2

Greedy method : general method, knapsack problem, tree vertex splitting, job sequencing with dead lines, optimal storageon tapes.

Unit 3.

Dynamic programming : General method, multistage graphs, all pairs shortest paths, dfs, bfs, connected components,biconnected components and dfs.

Unit 4

Back tracking : general method, 8 queens, sum of subsets, graph colouring, Hamilton cycles.

Branch and bound : General method, traveling salesperson problem.

Unit 5

Lower bound theory, comparison trees, Oracles and advisory arguments, Lower bounds through reduction, Basic conceptsof Np – Hard and Np – Complete problems.

Reference books:

1. Horowitz, Sahni&Rajasekaran, Fundamentals of Computer algorithms, 2ndedn, University Press.
2. Aho, Hopcroft, Ullman, The Design and analysis of computer algorithms, Pearson
3. Baase and Gelder, Computer Algorithms Introduction to Design and analysi, 3rdedn, Pearson, 2000
4. A Levitin, Introdunction to the Design and analysis of algorithms, 2ndedn, Person.

MCS3E05 INFORMATION SECURITY

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Foundations of Cryptography and security: Ciphers and secret messages, security attacks and services.

Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques), steganography.

Mathematics for cryptography: Euclid's algorithm , modular arithmetic, Linear congruence , Groups, rings and fields, finite fields, polynomial arithmetic.

Unit 2

Block cipher principles – The data encryption standard (DES) – strength of DES – Differential and linear cryptanalysis – Block cipher design principles.

Advanced encryption standard – AES structure – AES transformation function – key expansion – implementation.

Block cipher operations –Multiple encryption – ECB – CBC – CFM – OFM – Counter mode.

Pseudo Random Number generators - design of stream cipher, RC4.

Unit 3

Public Key cryptography: Prime numbers and testing for primality, factoring large numbers, discrete logarithms.

Principles of public-key crypto systems - RSAalgorithm.

Diffi-Helman Key exchange, Elgammal Cryptographic systems - elliptic curve arithmetic, elliptic curve cryptography.

Hash functions – examples – application – requirements and security – Hash function based on Cipher block chaining – Secure Hash algorithm.

Unit 4

Message authentication requirements - Message authentication functions – requirements of message authentication codes - MAC security – HMAC – DAA – CCM – GCM.

Digital signatures, ElGamal and Schnorr Digital signature schemes, Digital signature standard.

Unit 5

Key management and distribution – Symmetric key distribution using symmetric and asymmetric encryption. Distribution of public keys, Public Key Infrastructure,

User Authentication: Kerberos.

Electronic mail security: Pretty Good Privacy,S/MIME.

IP and Web security protocols :secure socket layer and transport layer security, HTTPS – IP security overview and policy.

Firewall and Intrusion Detection: virus and related threats, virus counter measures,intrusion detection and password management, firewall design principles.

Reference books

1. William Stallings, Cryptography and Network Security, Pearson 2004
2. Foorouzan and Mukhopadhyay, Cryptographiy and Network security, 2nd edn
3. BuceSchneier., Applied cryptography – protocols and algorithms, Springer Verlag 2003
4. William stallings, Network Security Essentials, , 4th edn, Pearson
5. Pfleeger and Pfleeger, Security in Computing, 4th Edn, Pearson

MCS4E06 DIGITAL IMAGE PROCESSING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Steps in Digital image Processing, Elements of Visual perception, Image Sensing and Acquisition, Image sampling and quantization, Basic pixel relationships,

Basic Intensity Transformation functions – Negatives, Log transforms, Power law transformations, Piecewise Linear Transformation functions.

Unit 2

Histogram processing, Fundamentals of spatial filtering, Smoothing spatial filters, Sharpening spatial filters.

Filtering in the Frequency domain : DFT of one and two variables, Properties of 2-D DFT, Basics of filtering in the Frequency domain. Image smoothing filters (Ideal Lowpass, Gaussian Lowpass), Image sharpening filters (ideal Highpass, Gaussian Highpass, Laplacian in the Frequency domain. Selective filtering – Notch filters.

Unit 3

Image restoration and reconstruction : Model, noise models, restoration in the presence of noise only – spatial filtering, Periodic noise reduction by frequency domain filtering.

Linear, Position **–** invariant degradation.

Color models – RGB and HIS.

Unit 4

Image compression : Fundamentals, Compression methods (Huffman, Arithmetic coding, LZW coding, run Length coding, Wavelet coding). Digital watermarking.

Morphological Image Processing: Erosion and dilation, opening and closing, Hit-or-miss transformation, Morphological algorithms (Boundary extraction, Thinning, thickening, skeletons, pruning).

Unit 5

Image segmentation : Fundamentals, Point and line and edge detection, Thresholding, Region-based thresholding.

Representation and description : Representation – Boundary following and chain codes, skeletons. Boundary descriptors – Simple descriptors, shape numbers.Regional descriptors – simple descriptors.

Text Book :

1. Gonzalez and Woods, Digital Image Processing, 3rdEdn, Pearson.

Reference Book:

1. Anil K. Jain, Fundamentals of Digital image Processing, Prentice Hall, US Ed., 1989.
2. William K. Pratt, Digital Image Processing: PIKS Scientific Inside, Wiley Interscience, 4th Ed., 2007
3. Bernd Jahne, Digital Image Processing, Springer, 6th Ed., 1997
4. Sonka, Hlavac, Boyle, Digital Image Processing and Compurter Vision, Cengage, 2008

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MCS4E07 DIGITAL SPEECH PROCESSING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction to speech recognition: Introduction- the paradigm for speech recognition –history of speech recognition research, The speech signal: speech production mechanism, perception-acoustic phonetic characterization and classification- the speech production process- representing speech in time frequency domains-speech sounds and features. Approaches to automatic speech recognition by machine, speech recognition in adverse environment.

Unit 2

Signal Processing and Analysis Methods for Speech Recognition: Introduction- The Bank of Filters Front End Processor- Linear Predictive Coding for Speech Recognition- Vector Quantization, Time domain parameters of speech, methods for extracting the parameters, zero crossing, auto correlation function, pitch estimation.

Unit 3

Pattern Comparisons Techniques: Introduction- Speech Detection- Distortion Measures - Spectral Distortion Measures. Incorporation of Spectral Dynamic Features into Distortion Measures- Time Alignment Normalization. Speech Recognition System Design and Implementation Issues: Introduction, Application of Source Coding Techniques to Recognition- Template Training Methods- Performance Analysis and Recognition Enhancements- Discriminative Methods in Speech Recognition.

Unit 4

Large Vocabulary Continuous Speech Recognition: Introduction, Subword Speech units, Subword Unit Models Based On HMMs, training of Subword Units, Language Models for Large Vocabulary Speech Recognition, Statistical Language Modeling, Perplexity of the Language Model, Overall recognition System Based on Subword Units, Context-Dependent Subword Units, Creation of Vocabulary-Independent Units, Semantic Postprocessor for recognition

Unit5

Task Oriented Applications of Automatic Speech Recognition: Introduction, Speech-Recognizer Performance Scores, Characteristics of Speech- Recognition Applications, Broad Classes of Speech-Recognition Applications, Command-and-Control Applications, Projections for Speech recognition. **Speaker Verification:** Introduction, Acoustic Parameters, Similarity Measures, Text- Dependent Speaker Verification, Text- Independent Speaker Verification, Text-Prompted Speaker Verification, Identification, Verification and the Decision Threshold.

Reference Book:

1. Lawrence Rabiner, Biing-Hwang Juang, Fundamentals of Speech Recognition,Prentice Hall.
2. Ben Gold and Nelson Morgan, Speech and Audio Signal Processing- John Willey & sons, 2011.
3. L R Rabiner and Schafer ,Digital processing of speech signals, Prentice hall. 1978.
4. Jurafsky and Martin, Speech and Language Processing – An introduction to Natural Language Processing, Computational Linguistics, and Speech recognition, 2013, Pearson

MCS4E08 OPERATIONS RESEARCH

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Linear programming: Formulation, Graphical Solution-2 variables, Development of Simplex Method,Artificial Variable Techniques, Big- M method, Two-Phase method, Reversed Simplex method.

Unit 2

Duality in LPP and it's formulation, Dual Simplex Method, Bounded variable method, Applications of LPP, Transportation problems, Assignment Problem, Traveling Sales persons problem.

Unit 3

Integer Programming problem (IPP), Cutting Plane algorithm, Branch and bound method of solving IPP, Dynamic programming problems and it's characteristics, Deterministic Dynamic Programming Problem.

Unit 4

Sequencing Problem, Processing n jobs through two machines and their mechanics, Processing n jobs through m machines, Processing 2 jobs through m machines, Project scheduling by PERT / CPM,Difference between PERT / CPM, Constructing the network, Critical path analysis, Float of an activity,Three time estimated for PERT, project cost by CPM.

Unit 5

Stochastic process, Classification of stochastic process, Discrete parameter Markov chains, Continuous Parameter Markov Chains, Birth and Death Processes, Queuing model and it's characteristics, Classification of Queuing Model (M/M/1): FCFS(birth and death model)z//.

Reference Books

1. Thaha H.A.- Operation Research, 9TH Edn, Pearson
2. Sharm J.K, Mathematical Models in Operation Research, TMGH, 1989.
3. Trivedi, . Probability, Statistics with Reliability, Queuing and Computer Science Applications, PHI
4. Winston, Operations Research Applications and Algorithms, 4th edn, CENGAGE, 2003

MCS4E09 LINUX KERNEL

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction: Characteristics, multi-tasking, multi-user access, multiprocessing, architecture independence, demand load executable, paging, dynamic cache for hard disk, shared libraries, POSIX 1003.1 support, various formats for executable files, Memory protected mode, support for national keyboards and fonts, different file systems, TCP/IP, SLIP and PPP *support*; Compiling the kernel; Configuration facilities; Kernel architecture; Processes and tasks; Important data structures, task structure, process table, files and inodes, dynamic memory management, queues and semaphores, system time andtimers; Main algorithms, signals, interrupts, booting the system, timer interrupt, scheduler; System call, working, getpid,nice, pause, fork, execve, exit, wait; Implementing new system calls.

Unit 2

Memory Management: Architecture independent memory model; Pages of memory; Virtual address space; Converting the linear address; Page directory; page middle directory; page table; Virtual address space; user segment; virtual memory areas; brk system call; Mapping functions; Kernel segment; Static and dynamic memory allocation in the kernel segment; Block device caching; Block buffering; update and bdflush processes; Buffer cache list structures; Paging; Page cache and management; Finding free page; reloading a page.

Unit 3

Inter-process communication**:** Synchronization; Communication via files, locking; Pipes; System V IPC, access permissions, numbers and keys, semaphores, message queues, shared memory, ipcs and ipcrm commands; IPC with sockets; Unix domain socket implementation.

Unit 4

File System**:** Basic principles; Representation in the kernel; Mounting; Superblock operations; Inode; Inode operations; File structure; File operations; File opening; Directory cache; Proc file system; Ext2 file system; Structure; Directories in ext2 file system; block allocation.

Unit 5

Device Drivers: Character and block devices; Polling and interrupts; Interrupt mode; Interrupt sharing; Bottom halves; Task queues; DMA mode; Hardware detection; Automatic interrupt detection; Driver implementation; setup function; init; open and release; read and write; IOCTL; select; lseek; mmap; readdir; fsync and fasync; check_media_change and revalidate.

Reference books:

1. M beck , Linux Kernel Internals, Second edition, Addison Wesley. 1998
2. Robert Love, Linux Kernel Development, SAMS, 2003
3. Bovet and Cesati, Understanding the Linux Kernel, 3rdEdn, O'Reilly

MCS4E10 SIMULATION AND MODELING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction: simulation, Merits and demerits, Areas of application, System and Environment, Components of System, Discrete and Continuous systems, types of models. Steps in simulation study, Simulation Examples, Concepts in Discrete event simulation, Event scheduling Vs Time advance algorithms.Manual simulation Using Event Scheduling, List processing. Simulation in Java, Simulation in GPSS.

Unit 2

Statistical Models: Useful statistical model, Discrete distribution, Continuous distribution,Queuing Models: Characteristics of queuing systems, queuing notations, long run measures of performance of queuing systems, Steady state behavior of Markovian models (M/G/1, M/M/1, M/M/c), Steady state behavior of finite population models, Network of Queues.

Unit 3

Random Numbers: Roles of random numbers in simulation, pseudo random number generation techniques- there properties, methods of testing PRN sequence. Random Varieties: Generation, Inverse transformation techniques, Acceptance Rejection techniques, Direct transformation technique and Convolution method.

Unit 4

Input Modeling: Data collection, identifying the Distribution, parameter estimation, Goodness of fit tests. Input models without data, Multivariate and Time series input models. Verification and Validation of Models: Model building, Verification, and Validation, Verification of simulation models, Calibration and Validation of models.

Unit 5

Output Analysis for a Single Model: Types of simulations with respect to output analysis, Stochastic nature of output data, Measure of performance and their estimation, Output analysis of terminating simulators, Output analysis for steady state simulation. Comparison and Evaluation of Alternative System Design: Comparison of two system design, Comparison of several system design, Meta modeling,Optimization via simulation.

Case Studies: Simulation of manufacturing systems, Simulation of computer systems, Simulation of super market, Simulation of pert network.

Text book:

1. Jerry Banks. John S. Carson & Barry L. Nelson - Discrete Event system simulation PHI India 2001.

Reference books:

1. Geoffrey Gordon, System Simulation, 2nd Edition, Prentice Hall, India, 2002.
2. N.Deo System simulations with Digital computers, PHI 1979.
3. James A Payne, Introduction to Simulation : Programming Techniques & Methods of Analysis MGH 1988 .
4. Sengupta , System Simulation and Modeling, Pearson, 2014

MCS4E11 MOBILE COMPUTING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Introduction to Mobile computing: Functions, types of networks, architecture for mobile computing, design considerations for mobile computing.

Unit 2

Evolution of telephony, multiple access procedures, satellite communication systems, mobile computing through telephone, IVR, Voice XML, Bluetooth, RFID, WiMAX, Mobile IP, IPv6.

Unit 3

GSM – architecture, entities, call routing, PLMN interfaces, GSM addresses and identifiers, network aspects in GSM, mobility management, GSM frequency allocation, authentication and security. SMS –architecture and types. GPRS – GPRS and packet data network, GPRS network architecture, GPRS network operations, Data services in GPRS.

Unit 4

WAP – WAP protocol stack, WAP application environment, WML &WMLScript, WAP Push architecture, Protocols used in WAP, WAP Gateway. CDMA & 3G – Spread-Spectrum Technology, CDMA v/s GSM, IS-95 standards, 802.11 standards, Third generation networks and applications on 3G, WLAN architecture.

Unit 5

Voice over IP – H.323 Framework, SIP, Real time protocols, Convergence technologies, Call routing, VoIP applications, Mobile VoIP, Voice over WLAN.

Text Book:

1. AsokeTalukder, Hasan Ahmed, and RoopaYavagal. Mobile Computing, Technology, Applications and Service Creation, 2d Edition, McGraw Hill Education (India) Pvt. Ltd., New Delhi. 2010.

Reference Books:

1. Raj Kamal. Mobile Computing, Oxford University Press. 2007.
2. ItiSahaMisra. Wireless Communications and Networks, 3G and Beyond, Tata McGraw Hill Education Pvt. Ltd., New Delhi. 2009.
3. Schiller, Mobile communication, 2nd edn, Pearson
4. Perahia and Stacey, Next Generation Wireless LANs, Cambridge, 2009
5. Shende, Mobile computing for beginners, ShroffPubl& Distributers, 2012
6. ReezaB'Far, Mobile computing principles, Cambridge, 2005

MCS4E12 PATTERN RECOGNITION

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Pattern Classifier – Over view of Pattern recognition – discriminant functions - Supervised learning - Parametric estimation – Maximum Likelihood estimation - Bayesian Parametric estimation – Perceptron Algorithm – LMSE algorithm – Problems with Bayes approach – Pattern classification by Distance functions- minimum distance Pattern classifier.

Unit 2

Unsupervised classifications - clustering for unsupervised learning and classification – Clustering concept – C means algorithm – Hierarchical clustering procedures – Graph theoretic approach to pattern clustering – Validity of clustering solutions.

Unit 3

Structural Pattern recognition - Elements of formal Grammars – String generation as Pattern description – Recognition of syntactic description – Parsing – Stochastic Grammars and Applications –Graph based structural representation.

Unit 4

Feature extraction and selection –Entropy minimization – Karhunen – Loeve Transformation – Feature selection through functions approximation – Binary feature selection.

Unit 5

Recent Advances- Neural network structures for Pattern Recognition - Neural networkbased pattern associators- Unsupervised learning in Neural Pattern Recognition - Self organizing networks - Fuzzy logic- Fuzzy pattern classifiers – Pattern classification using Genetic algorithms.

Reference Books:

1. R. J. Schalkoff, Pattern Recognition : Statistical, Structural and Neural approaches, Wiley Student Edn, 1992.
2. Tou and Gonzalez, Pattern Recognition Principles, Addison Wesley, 1974.
3. Duda, Hart and Stork, Pattern Classification, 2ndEdn, John Wiley and Sons
4. Morton Nadler, Eric P Smith, Pattern Recognition Engineering, Wiley, 1993.

MCS4E13 ARTIFICIAL NEURAL NETWORKS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Fundamental concepts, Evolution, Basic models of ANN, Terminologies, MP neurons, Linear Separability, Hebb network.

Unit 2

Supervised Learning Networks: Perceptron networks, Adaptive Linear Neuron, Multiple Adaptive Linear Neurons, Back Propagation Networks.

Unit 3

Associative Memory Networks: Training algorithms for pattern classification, Autoassociative memory network, Hetroassociative memory network, BAM, Hopefield Net.

Unit 4

Unsupervised Learning Networks: Fixed weights competitive nets, Kohenon Self-Organizing Maps, Learning Vector quantization.

Unit 5

Unsupervised Learning Networks (contd): Counter propagation networks, Adaptive Resonance theory Networks.

Text Book :

1. Sivavndan, Deepa, Principles of Soft Computing, 2ndEdn, Wiley India.

Reference Book:

2. B. Yegnanarayana, Artificial Neural Networks, PHI
3. Rajasekharan and Viajayalakshmipai, Neural Networks, Fuzzy Logic and Genetic Algorithm, PHI, 2003
4. Satish Kumar, Neural Networks a class room approach, 2ndEdn, McGraw Hill.

MCS4E14 HIGH PERFORMANCE COMPUTING

Contact Hours/ week : 3 **Credit : 3**

Unit 1: Parallel Processing Concept

Levels of parallelism (instruction, transaction, task, thread, memory, function)- Models (SIMD, MIMD, SIMT, SPMD, Dataflow Models, Demand-driven Computation etc)- Architectures: N-wide superscalar architectures, multi-core, multi-threaded

Unit 2: Parallel Programming with CUDA

Processor Architecture, Interconnect, Communication, Memory Organization, and Programming Models in high performance computing architectures: (Examples: IBM CELL BE, Nvidia Tesla GPU, Intel Larrabee Microarchitecture and Intel Nehalem microarchitecture- Memory hierarchy and transaction specific memory design- Thread Organization

Unit 3: Fundamental Design Issues in Parallel Computing

Synchronization- Scheduling- Job Allocation-Job Partitioning- Dependency Analysis- Mapping Parallel Algorithms onto Parallel Architectures- Performance Analysis of Parallel Algorithms

Unit 4: Fundamental Limitations Facing Parallel Computing and power aware techniques

Bandwidth Limitations- Latency Limitations- Latency Hiding/Tolerating Techniques and their limitations- Power-aware Processing Techniques-Power-aware Memory Design- Power-aware Interconnect Design-Software Power Management.

Unit 5: Advanced Topics

Petascale Computing-Optics in Parallel Computing- Quantum Computers- Recent developments in Nanotechnology and its impact on HPC

References

1. George S. Almasi and AlanGottlieb, Highly Parallel Computing, Benjamin Cumming Publishers.
2. Kai Hwang ,Advanced Computer Architecture: Parallelism, Scalability, Programmability, McGraw Hill 1993
3. David Culler, Jaswinder Pal Singh, Anoop Gupta, Parallel Computer Architecture: A hardware/Software Approach, Morgan Kaufmann, 1999.
4. K. Hwang& Z. Xu, Scalable Parallel Computing – Technology, Architecture, Programming., McGraw Hill 1998.
5. William James Dally and BrianTowles, Principles and Practices on Interconnection Networks, Morgan Kauffman 2004.
6. Hubert Nguyen , GPU Gems 3, Addison Wesley, 2008, (Chapter 29 to Chapter 41)
7. AnanthGrama, Anshul Gupta, George Karypis, and Vipin Kumar, Introduction to Parallel Computing, , 2nd edition, Pearson, 2003.
8. David A. Bader (Ed.), Petascale Computing: Algorithms and Applications, Chapman & Hall/CRC, 2008.

MCS4E15 VISUAL CRYPTOGRAPHY

Contact Hours/ week : 3 **Credit : 3**

UNIT 1

Digital image Processing: Fundamentals:- Digital Image Representation-coordinate conversions, images as matrices, Image Types- intensity images, binary images, RGB images; Color Image Processing:-, Colour Image Representation- RGB model, CMY model, CMYK model, HSI model. Image file formats.

UNIT 2

Principles of steganography and digital watermarking and their applications.

Secret Sharing- Introduction,History of secret sharing, principle of secret splitting, phases of secret sharing, Access Structures, Threshold Schemes, Shamir’s Scheme, Applications.

UNIT 3

Visual Cryptography- Introduction- History of Visual Cryptography, Construction of Visual Cryptography Schemes, basis matrices, Construction of 2-out-of-2 Visual Cryptography Schemes, Construction of 2-out-of-2 Visual Cryptography Schemes with Square Pixel Expansion, Construction of Visual Cryptography Schemes with Consistent Image Size.

UNIT 4

Visual Cryptography Schemes- Construction of 2-out-of-n Visual Cryptography Schemes, Basis Matrices for 2-out-of-n Visual Cryptography Schemes, Construction of n-out-of-n Visual Cryptography Schemes, Basis Matrices for n-out-of-n Visual Cryptography Schemes, Construction of k-out-of-n Visual Cryptography Schemes, Basis Matrices for k-out-of-n Visual Cryptography Schemes.

UNIT 5

Colour Visual Cryptography – subpixel layout of colour visual cryptography, Variations of colour visual cryptography Schemes- Constructing a '2 out of 2' colour Visual Cryptography Schemes, Constructing a '2 out of n' colour Visual Cryptography Schemes, Applications of Visual Cryptography.

References

1. BorkoFurht, EdinMuharemagic and Daniel Socek, Multimedia Encryption and Watermarking, Springer.
2. Rafael C. Gonzalez, Richard E. Woods, Digital Image Processing, Pearson Education.
3. Jen- Shyang Pan, Hsiang- Cheh Huang and Lakhi C. Jain,Intelligent Watermarking Techniques, World Scientific.
4. Josef Pieprzyk, Thomas hardjino and Jennifer Sebberry,Fundamentals of computer security, Springer International Edition 2008.

MCS4E16 LINUX DEVICE DRIVERS

Contact Hours/ week : 3 **Credit : 3**

Unit 1

An introduction to Device Drivers: The role of the device driver, Splitting the kernel, Classes of devices and modules, Security issues.

Building and running modules: Kernel modules Vs applications, User space and kernel space, Concurrency in kernel, Current process, Compiling and loading, The kernel symbol table, Error handling in init_module, Usage count, I/O ports and I/O memory, Advantages and disadvantages of user space.

Unit 2

Char Drivers: Major and minor numbers, Dynamic allocation of major numbers, Removing a driver from the system, dev_t and kdev_t, File operations, File structure, open and release, Introduction to race conditions, Read and write, Device file system.

Enhanced Character driver operations: ioctl, Blocking I/O, Poll and select, Asynchronous notification.

Flow of Time: Time intervals in kernel, Knowing the current time, Delaying execution, Task queues, Kernel timers.

Unit 3

Hardware Management: I/O Ports and I/O Memory, Using I/O ports, Using digital I/O ports, An overview of parallel ports, Using I/O memory.

Interrupt Handling: Overall control of interrupts, Installing an interrupt handler, Implementing a handler, Tasklets and bottom half processing, Tasklets, The BH mechanism, Interrupt sharing, Interrupt driven I/O, Race conditions, Circular buffers, Spin locks, Lock variables.

Kmod and Advanced Modularization: Loading modules on demand, Requesting modules in the kernel, The use space side, Module loading and security, Intermodule communication.

Unit 4

Mmap and DMA: Memory management in Linux, Address types, High and low memory, The memory map and struct page, page Tables, Virtual memory areas, The mmap device operation, The kiobuf interface, Direct memory accessing and Bus mastering.

Network Drivers: Connecting to the kernel, Thenet_device structure, Opening and closing, Packet Transmission, Controlling transmission concurrency, Packet reception, The interrupt handler, The socket buffers, MAC address resolution, Multicasting.

Unit 5

Overview of Peripheral Buses: The PCI Interface, PCI Addressing, PCI Interrupts, PC/104, PC/104+, MCA, EISA, SBus, NuBus, External Buses, USB.

Physical Layout of The Kernel Source: Booting the kernel, Theinit process, The kernel directory, The fs directory, The mm directory, The net directory, ipc and lib, Drivers.

Reference Books:

1. Alessandro Rubini and Jonathan Corbet. “Linux Device Drivers. “, 3rdedn. O’Reilly.
2. S. Venkateswaran, Essential Linux Device Drivers, Pearson Edn, 2008.

MCS4E17 DATA MINING

Contact Hours/ week : 3 **Credit : 3**

Unit 1:

Introduction – kinds of data and patterns – technologies, applications, major issues.

Data objects and attribute types – statistical descriptors of data – Data visualization, measuring data similarity and dissimilarity.

Data preprocessing – data cleaning - data integration - data reduction – data transformation and discretization.

Unit 2:

Data warehouse – Basic concepts – DW modeling (Data cube and OLAP), Design & usage, Implementation, Data generalization by attribute oriented induction

Mining frequent patterns – basic concepts - frequentitemset mining methods, Pattern Evaluation methods.

Unit 3:

Classification and prediction – basic concepts, Decision tree induction – Bayes classification – rule based classification – model evaluation and selection – Techniques to improve classification accuracy.

Unit 4:

Advanced classification methods – Bayesian Belief networks, Back propagation – Using frequent patterns, Lazy learners.

Cluster analysis - categorization – partitioning methods – hierarchical methods – density based methods – grid based methods – evaluation of clustering .

Unit 5:

Probabilistic Model based clustering.

Outlier detection – outliers and outlier analysis – outlier detection methods – statistical and proximity based approaches..

Overview of spatial, multimedia, text and web mining.

Text book:

1. J. Han, M. Kamber& J. Pei, Data Mining - Concepts and Techniques, 3rdEdn, Morgan Kauffman, 2012.

Reference Books:

1. K.P. Soman, ShyamDiwakar and V. Ajay, Insight into Data mining Theory andPractice, Prentice Hall of India, 2006.
2. Alex Berson and Stephen J. Smith, Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill, 2007.
3. G. K. Gupta, Introduction to Data Mining with Case Studies, 2ndedn, PHI.
4. Witten, Frank and Hall, Data Mining – Practical Machine Learning Tools and Techniques, 3rd Edition, Morgan Kauffman, 2011.
5. A K Pujari, Data Mining Techniques, 2ndedn, Universities Press, 2013.

MCS4E18 NATURAL LANGUAGE PROCESSING

Contact Hours/ week : 3 **Credit : 3**

Unit 1

Morphology and Finite State transducers, N – grams.

Unit 2

Word classes and part of speech tagging, Context free grammars for English, Parsing with context free grammars.

Unit 3

Features and Unifications, Lexicalized and Probabilistic parsing.

Unit 4

Semantics: Representing meaning, Semantic analysis, Lexical semantics, Word Scene Disambiguation and Information retrieval.

Unit 5

Pragmatics: Discourse, Dialog and Conversational Agents, Natural Language Generation, Machine Translation.

Text book :

1. Jurafsky and Martin, Speech and Language Processing, Pearson, 2013

Reference Books:

1. Allen, James, Natural Language Understanding, Second Edition, Benjamin/Cumming, 1995

2. Charniack, Eugene, Statistical Language Learning, MIT Press, 1993.
3. Manning, Christopher and Heinrich, Schutze, Foundations of Statistical Natural Language Processing, MIT Press
4. Kao, Natural Language Processing and Text Mining, Springer

MCS4E19 CYBER FORENSICS

Contact Hours/ week : 3 **Credit : 3**

UNIT 1

Computer Forensics Fundamentals: What is Computer Forensics?, Use of Computer Forensics in LawEnforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of Professional Forensics Methodology, Steps taken by Computer Forensics Specialists.

Types of Computer Forensics Technology: Types of Military Computer Forensic Technology, Types of Law Enforcement - Computer Forensic Technology - Types of Business Computer Forensic Technology Computer Forensics Evidence and Capture: Data Recovery Defined -Data Back-up and Recovery-The Role of Back-up in Data Recovery - The Data- Recovery Solution.

UNIT 2

Evidence Collection and Data Seizure: Why Collect Evidence? Collection Options obstacles--Types ofEvidence - The Rules of Evidence-Volatile Evidence - General Procedure - Collection and Archiving - Methods of Collection -Artifacts - Collection Steps - Controlling Contamination: The Chain of Custody. Duplication and Preservation of Digital Evidence: Preserving the Digital Crime Scene – Computer Evidence Processing Steps - Legal Aspects of Collecting and Preserving Computer Forensic Evidence Computer Image Verification and Authentication: Special Needs of Evidential Authentication – Practical Consideration -Practical Implementation

UNIT3

Computer Forensics analysis and validation: Determining what data to collect and analyze,validating forensic *data.* addressing data-hiding techniques, performing remote acquisitions Network Forensics: Network forensics overview, performing live acquisitions, developing standard procedures for network forensics, using network tools, examining the honeynet project.

Processing Crime and Incident Scenes: Identifying digital evidence. collecting evidence in private-sectorincident scens, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case.

UNIT 4

Current Computer Forensic tools: evaluating computer forensic tool needs, computer lOrensics software tools, computer forensics hardware tools, validating and testing forensics software

E-Mail Investigations: Exploring the role of e-mail in investigation, exploring the roles of the client and server in email, investigating e-mail crimes and violations, understanding e-mail servers, using specialized e-mail forensic tools

Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones arid mobile devices.

UNIT5

Working with Windows and DOS Systems: understanding file systems, exploring Microsoft File Structures.Examining NTH disks.Understanding whole disk encryption, windows registry.NI Microsoft startup tasks. MS-DOS startup tasks, virtual machines.

Reference Books:

1. Jhon R. Vacca, Computer Forensics, Computer Crime Investigation, Firewall Media, New Delhi.

2. Nelson. Phillips Enfinger.Steuart, Computer Forensics and Investigations, CENGAGE Learning
3. Britz, Computer Forensics and Cyber Crime – An Introduction, 2nd Edn, Pearson.

MCS4E20 ARTIFICIAL INTELLIGENCE

Contact Hours/ week : 3 **Credit : 3**

UNIT 1

Introduction - Overview of AI applications. Introduction to representation and search.

The Propositional calculus, Predicate Calculus, Using Inference Rules to produce Predicate Calculus expressions, Application – A Logic based financial advisor.

UNIT 2

Introduction to structure and Strategies for State Space search, Graph theory, Strategies for state space search, Using the State Space to Represent Reasoning with the Predicate calculus (Sate space description of a logical system, AND/OR Graph).

Heuristic Search : introduction, Hill-Climbing and Dynamic Programming, The Best-first Search Algorithm, Admissibility, Monotonicity and informedness, Using Heuristics in Games.

UNIT 3

Building Control Algorithm for Statespace search – Introduction, Production Systems, The blackboard architecture for Problem solving.

Knowledge Representation – Issues, History of AI representational schemes, Conceptual Graphs, Alternatives to explicit Representation, Agent based and distributed problem solving.

UNIT 4

Strong Method Problem Solving **–** Introduction,Overview of Expert System Technology, Rule Based Expert system, Model -Based, Case-Based and Hybrid Systems (Introduction to Model based reasoning, Introduction to Case Based Reasoning, Hybrid design), Introduction to Planning.

Reasoning in Uncertain Situation – introduction, logic based Abductive Inference.

Introduction to PROLOG , Syntax for predicate Calculus programming, ADTs, A production system example.

UNIT5

Machine Learning: Symbol Based – Introduction, Frame –work. The ID3 Decision tree Induction algorithm. Inductive bias and Learnability, Knowledge and Learning, Unsupervised learning, Reinforcement Learning,

Machine Learning : Connectionist – Introduction, foundations, Perceptron learning.

Machine learning : Social and emergent: Models, The Genetic Algorithm, Artificial Life and Social based Learning.

Text book :

1. George F Luger, Artificial Intelligence – Structures and Strategies for Complex probel solving, 5th Edn, pearson.

Reference Books:

1. E. Rich, K. Knight, S B Nair, Artificial intelligence, 3rd Edn, McGraw Hill.
2. S. Russel and p. Norvig, Artificial intelligence – A Modern Approach, 3rd Edn, pearson
3. D W Patterson, introduction to Artificial Intelligence and Expert Systems, PHI, 1990

Syllabus – Lab Courses

MCS1P01 Lab I (IP/OS)

Hours/Week : 8 +2 **Credit : 3**

Section A – Introduction to Programming (C & C++) (5 +2 Hours / Week)

Faculty-in-charge shall prepare a list of experiments at the beginning of the semester. For the ESE, question will be selected from this list. All exercises must be done under Linux environment.

Sr No	Topic /Description	Minimum Number of Programs
1	If and switch statements.	1
2	Using Loops	2
3	String manipulation	1
4	Search	1
5	Sort	1
6	Matrix operations	2
7	Functions	2
8	Pointer	2
9	Structure / Union	2
10	Class, constructors, destructors – simple programs	5
11	Friend function	1
12	Friend class	1
13	Function overloading	1
14	Operator overloading	1
15	Programs illustrating Inheritance , Virtual base class, Polymorphism, virtual functions	3
16	C++ Files	1
17	STL	1
18	C++ I/O based exercises	2
	Total	30

Section B : Operating System (3 hours per week)

Faculty-in-charge shall prepare a list of experiments at the beginning of the semester. Use C/C++ for high level programming.

- i. Linux basic and essential commands
- ii. Editors in Linux
- iii. Linux Shell programming : minimum 5 programs
- iv. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
- v. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
- vi. Implement memory management schemes (Minimum two schemes).

ESE Scheme of evaluation

1. Record of work done duly certified : 10
2. C program : 20
3. C++ program : 20
4. Viva based on C/C++ : 10
5. Linux shell program : 10
6. Viva based on Linux lab assignments : 10

Total : 80

For 2,3 and 5:
Program writing : 5
Execution without errors: 5
Output : 5
Questions based on the program and/or Modification: 5

MCS2P02 Lab II (Java/DS/DBMS)

Hours/Week :7 +1 **Credit : 3**

Section A– JavaProgramming (2 +1 Hours per week)

Faculty-in-charge shall prepare a list of experiments, based on the topics specified below, at the beginning of the semester. For the ESE, question will be selected from this list. All exercises must be done under Linux environment.

Sr No	Topic / Description	Minimum Number of Programs
1	Simple programs employing class – covering basic class concepts.	2
2	Nested and Inner class	1
3	String manipulation	1
4	Command line arguments	1
5	Inheritance, Method overloading /overriding, Abstract class	3
6	Packages – Covering important concepts in package	2
7	Exception handling	1
8	Thread and multi-threaded applications	3
9	Applet	2
10	AWT	2
11	Event driven programs	2
12	Database connectivity - jdbc	2
	Total	22

Section B : Data Structures (3 hours per week)

Faculty-in-charge shall prepare a list of experiments at the beginning of the semester. Use C++ under Linux for implementation. Employ class concepts and features of C++ in all exercises.

Sr No	Topic / Description	Minimum Number of Programs
1	Polynomial representation and operations	1
2	Sparse matrix representation and operations	1

3	Singly linked list	3
4	Doubly linked list	1
5	Stack/Queue with SLL	1
6	Infix to postfix	1
7	Postfix evaluation	1
8	Circular array queue	1
9	Create Binary tree	1
10	Recursive tree traversal	1
11	Non-recursive tree traversal	1
12	Threaded Binary tree	1
13	Binary search tree	1
14	AVL tree / Hashing	1
15	Dijkstra's algorithm/ Prim's algorithm/Kruskal	1
16	Quick sort / merge sort	2
17	Heap sort / Warshal's algorithm	1
	Total	20

Section C : Database Management Systems (2 Hours per week)

Faculty-in-charge shall prepare a list of experiments at the beginning of the semester. Use PostgrSQL for the lab exercises. ESE questions will be set based on the list provided by the faculty-in-charge. Exercises shall include the following components:

1. Create databases and tables, different types of Constraints, SQL queries to add/delete/retrieve data.
2. SQL queries : Update, modify, Alter, Join, nested queries etc.
3. Index, operators and functions, views, arrays, transactions, cursors, triggers, etc.
4. PostgreSQL Administration
5. PostgreSQL Programming - Pl/pgSQL
6. Case study – design of database for a simple application like payroll and its implementation.

ESE Scheme of evaluation

1. Record of work done duly certified : 10
2. Java or DS program : 30
3. DBMS : 20

4. Viva : 20

Total : 80

For 2:

Program writing :7

Execution without errors: 8

Output/Correctness : 8

Questions based on the program and/or Modification: 7

For 3

Program/Query writing : 5

Execution without errors: 5

Output/Correctness : 5

Questions based on the program/problem and/or Modification: 5

MCS3P04 Lab III (CG/NP&A/SP&CD)

Hours/Week :6 +2 **Credit : 3**

Section A – Computer Graphics(2 +1 Hours per week)

Faculty-in-charge shall prepare a list of experiments, based on the topics specified below, at the beginning of the semester. For the ESE, question will be selected from this list. All exercises must be done using OpenGL (under Windows or linux).

Sr No	Topic / Description	Minimum Number of Programs
1	OpenGL Point and Line functions with different attributes Simple OpenGL programs with I/O and Mouse support	2
2	Line drawing algorithms	2
3	Circle Drawing	1
4	Line Clipping	1
5	Polygon Clipping	1
6	2D transformations	1
7	3D View based	2
8	3D transformations	1
9	3D object representations	1
10	Visible surface detection methods	1
11	Illumination / Rendering	1
	Total	14

Section B : Network Programming and System Administration (2+1 hours per week)

Faculty-in-charge shall prepare adetailed descriptionof experiments.

Sr No	Topic / Description
1	Configuration : FTP, TFTP, IP address
2	Configuring NIS
3	Configuring DHCP.
4	Configuring SAMBA server.
5	Setting Domain Name Services.
6	SMTP and POP3
7	TCP chat program.
8	UDP chat program.
9	Socket program.
10	Configuring NFS.
11	LILO configuration
12	Crontab, at, Batch.
13	Kernel modules
14	Run levels
15	TCP - wrappers
16	Changing file permission, group and owner.
17	Syslog.conf
18	Backup (tar, cpio, dd etc.)
19	Rescue operations.

Section C : System Programming and Compiler Design (2 Hours per week)

Implement the following:

Sr No	Topic / Description
1	Simple Assembler
2	Using Lex and Yacc - validation of expressions, validation of variable names, implementation of calculator.
3	Implementing any three parsing algorithm
4	Implement Symbol Table
5	Intermediate code Generator
6	Code Optimizer.

ESE Scheme of evaluation

1.	Record of work done duly certified	: 10
2.	CG program	: 20
3.	NP & A	: 20
4.	Viva based on CG and NP&A exercises	: 15
5.	Execution of selected exercise from SP&CD and Viva based on that	: 15

Total : 80

For 2 and 3

Program writing : 5

Execution without errors: 5

Output/Correctness : 5

Questions based on the program/problem and/or Modification: 5

MCS2P03 Case Study I and MCS3P05 Case Study II

Hours/Week : 3+2 **Credit : 2**

The objective of the course is to inculcate self-learning skill in mastering software development tools. The department shall select one or more of Development tools such as .Net, Python, HTML/PHP/JavaScript, Android and Mathlab. The teacher-in-charge shall give an overview of the tool and if required arrange for lectures by external experts. The teacher may also help the students to find online tutorials/courses. A set of lab assignment shall be prepared by the teacher. Each student is expected to solve a problem using the tool(s) selected. Unlike project work, the focus should be on coding and testing of programs. A report with the statement of problem, description of solution, code and output is to be submitted for the external evaluation.

ESE Scheme of evaluation

1. Report duly certified : 10
2. Demonstration of the software : 15
3. Viva based on the Tool and Software : 15

MODEL QUESTIONS

I &II SEMESTER

INSTRUCTIONS TO QUESTION PAPER SETTER							
Semester : 1				**Course : MCS1C01 DISCRETE MATHEMATICS**			
Section A				**Section B**			
Total no of questions	**Mark per question**	**No of questions to be answered**	**Time per question**	**Total no of questions**	**Mark per question**	**No of questions to be answered**	**Time per question**
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION

UNIT	SECTION A	SECTION B
1	3	1
2	3	1
3	2	1
4	2	1
5	2	1

Note:

At least 60% of the questions should be problems.
The questions shall include simple/direct questions (approximately 30%), Average / moderate difficulty (40%) and Challenging / difficult questions 930%)

Model Question

FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS1C01 DISCRETE MATHEMATICS

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1.Write the following statements in symbolic form:

i. x is the father of mother of y.

ii. All men are mortal

2.Construct the truth table for $(P \rightarrow Q) \wedge (Q \rightarrow P)$

3. Show that $P \Rightarrow (P \vee Q)$

4. Show that $A \bigcup_{i=1}^{n} Bi = \bigcap_{i=1}^{n} (A - Bi)$

5. Let X={1,2,3,4} and R be the relation defined on the set X as R={<x,y>,x≤y}.Write the relation matrix.

6. Find the power set of {1,2,3,{1,2,3})

7. Find the value of n, if P(n,7)=12P(n,5).

8.Neethu has 5 friends, in how many ways can she invite two or more of them to a tea party.

9. Four dice are thrown simultaneously. Find the probability that all of them show the same face.

10. What is a subring? Find subring of **<I, +, . >,** where I is the set of Integers.

11. Define Bipartite graph. Give example.

12. Define the terms walk, path, trail and circuit.

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. a) Explain the different measures used in accessing the performance of computer systems.

OR

b) i. Explain the role of stacks.

ii. Explain instruction sequencing. (4+6)

14. a) Give a detailed account of Interrupts in relation to IO operations.

OR

b) Give a detailed account of USB standard.

15. a) Explain 3-bus organization of processors.

OR

b) With suitable example explain Booth algorithm.

16. a) Explain the organization and working of virtual memory.

OR

b) Discuss different cache mapping techniques.

17. a) Discuss the major issues related to pipelining.

OR

b) Explain the basic organization and advantages of Vector processing and shared memory multiprocessors.

(5 x 10 = 50 marks)

INSTRUCTIONS TO QUESTION PAPER SETTER							
Semester : 1	**Course : MCS1C02COMPUTER ORGANIZATION AND ARCHITECTURE**						
Section A				**Section B**			
Total no of questions	**Mark per question**	**No of questions to be answered**	**Time per question**	**Total no of questions**	**Mark per question**	**No of questions to be answered**	**Time per question**
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION		
UNIT	**SECTION A**	**SECTION B**
1	2	1
2	2	1
3	3	1
4	3	1
5	2	1

Model Question

FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS1C02 COMPUTER ORGANIZATION AND ARCHITECTURE

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. With suitable example explain 2’s complement scheme for signed integer representation.
2. Compare CISC and RISC.
3. What do you mean by bus arbitration?
4. Differentiate between program controlled IO and Interrupt driven IO.
5. Explain fetch-execute cycle.
6. How will store floating point numbers?
7. Give the basic principle of array multiplier.
8. Give the memory hierarchy.
9. What are the different types of DRAMs?
10. Explain any one page replacement strategy used in Cache memory.
11. Explain the idea of hardware multithreading.
12. List the advantages of pipeline processing.

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. a)Explain the different measures used in accessing the performance of computer systems.

OR

b) i. Explain the role of stacks.

ii. Explain instruction sequencing. (4+6)

14. a) Give a detailed account of Interrupts in relation to IO operations.

OR

b) Give a detailed account of USB standard.

15. a) Explain 3-bus organization of processors.

OR

b) With suitable example explain Booth algorithm.

16. a) Explain the organization and working of virtual memory.

OR

b) Discuss different cache mapping techniques.

17. a) Discuss the major issues related to pipelining.

OR

b) Explain the basic organization and advantages of Vector processing and shared memory multiprocessors.

(5 x 10 = 50 marks)

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INSTRUCTIONS TO QUESTION PAPER SETTER							
Semester : 1		Course : MCS1C03 DIGITAL SYSTEMS & MICROPROCESSORS					
Section A				Section B			
Total no of questions	Mark per question	No of questions to be answered	Time per question	Total no of questions	Mark per question	No of questions to be answered	Time per question
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION		
UNIT	SECTION A	SECTION B
1	3	1
2	3	1
3	2	1
4	2	1
5	2	1

Model Question

FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS1C03 DIGITAL SYSTEMS & MICROPROCESSORS

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. Show that complement of EX-OR is equal to its dual.
2. Discuss the main differences between SOP and POS circuits and their implementation.
3. What is the underlying principle of K-Map and Tabular method simplification? Illustrate with examples.
4. Show how a 2 to 4 decoder circuit can be modified to 1 to 4 Dmux.
5. What is Master-Slave Flip flop?
6. What are the disadvantages of ripple counters and how they are overcome?
7. What is addressing mode in a processor. List the different addressing modes in 8085 processor?
8. Explain the complete functioning of the following instructions in 8085 processor:
   i) ADD B ii) RST1
9. Give the Flag register of 8686.
10. What are assembler directives?
11. Explain the protection mechanism used in advanced processors.
12. What is the concept of page mode in 80386 processor?

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. a) i. Simplify the following function using K-Map and draw the simplified circuit.
$F(w,x,y,z)=\Sigma(0,1,2,3,7,8,10)$ and $d(w,x,y,z)=\Sigma(5,6,11,15)$
ii. Draw the circuit of a 4 bit parallel adder. 6+4

OR

b)i. Explain how parity is used for error checking. Show a scheme to generate even parity and transmission and checking at receiving end.

ii. Simplify the following boolean function using Tabular method finding the essential prime implicants and draw the circuit:
$F(A,B,C,D) = \Sigma(0,2,3,5,7,8,10,11,14,15)$ 4+6

14. a) Discuss the design of a Mod 10 counter.

OR

b) i. With the help of a block diagram, explain the working of serial to parallel shift register.

ii. With the help of a block diagram, explain the working of JK flip flop. 6+4

15. a) Explain the architecture of 8085 microprocessor.

OR

b) i. Explain the different operations taking place in each machine cycles while a CALL instruction is executed

ii. Draw the structure of register corresponding to SIM instruction and explain each bit.

6+4

16. a) Explain the architecture of 8086 microprocessor.

OR

b)Explain organization and working of 8255.

17. a) i. Compare 386 and 486 processors.
ii. Explain the memory management unit of advanced processors. 4+6

OR

b) Discuss the special features of Pentium processors.

(5 x 10 = 50 marks)

INSTRUCTIONS TO QUESTION PAPER SETTER							
Semester : 1 Course : MCS1C04 OPERATING SYSTEMS							
Section A				**Section B**			
Total no of questions	**Mark per question**	**No of questions to be answered**	**Time per question**	**Total no of questions**	**Mark per question**	**No of questions to be answered**	**Time per question**
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION

UNIT	SECTION A	SECTION B
1	2	1
2	3	1
3	3	1
4	2	1
5	2	1

Model Question

FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS1C04 OPERATING SYSTEMS

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. List the salient features of Real-time systems.
2. What do you mean by system calls? Give any two examples.
3. Explain the concept of multithreading.
4. Define “Critical section” and “Semaphores”.
5. Explain the CPU scheduling criteria.
6. Explain Thrashing.
7. Explain the relevance of Virtual memory concept in modern operating systems.
8. Compare Windows and Linux directory structure.
9. Explain the basic principle of RAID.
10. Explain “STREAMS”.
11. List the distinguishing features of Distributed Operating systems.
12. Explain the terms Stateful and stateless services.

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. **a)** Give a detailed account of Operating system services.

OR

b) Discuss the structure of a typical operating system.

14. a) Explain any two preemptive and any one non-preemptive scheduling algorithm. Illustrate the algorithms taking suitable example.

OR

b) What are the methods for handling deadlock? How will you prevent deadlock?

15. a) Explain the need for paging and segmentation. Discuss the different page replacement algorithms.

OR

b) Discuss : i. Free space management ii. NFS

16. a) Discuss Kernel I/O subsystems.

OR

b) Give a detailed account of Disk scheduling and Disk structure.

17. a) Explain the design issues of distributed systems.

OR

b) Give a comprehensive account of Protection.

(5 x 10 = 50 marks)

INSTRUCTIONS TO QUESTION PAPER SETTER							
Semester : 1 Course : MCS1C05 INTRODUCTION TO PROGRAMMING							
Section A				**Section B**			
Total no of questions	**Mark per question**	**No of questions to be answered**	**Time per question**	**Total no of questions**	**Mark per question**	**No of questions to be answered**	**Time per question**
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION		
UNIT	**SECTION A**	**SECTION B**
1	3	1
2	3	1
3	2	1
4	2	1
5	2	1

Model Question

FIRST SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS1C05 INTRODUCTION TO PROGRAMMING

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. Give the syntax of for loop and while Loop.
2. List and explain any three string functions.
3. Discuss hierarchy of operations in c expressions.
4. Write a function to find the length of a string.
5. Differentiate structure and Union.
6. What do you mean by preprocessor directives? Give examples.
7. What is a constructor? What are the different types of constructors in C++?
8. What do you mean by dynamic allocation of memory?
9. Give an example of operator overloading.
10. What is a virtual function?
11. What is a stream?
12. Explain the term “Name spaces”.

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. a) Write a complete c program to multiply two matrices.

OR

b) i. Write a c program to search a name in an array of n names.

ii. With suitable examples, explain the different decision making and branching constructs in c. 6+4

14. a) What is a pointer? What are the operations performed on pointers? Explain with example how pointers can be used to access array elements.

OR

b) i. Declare a structure for storing student information (make your own assumptions). Write a function to read details of a student into a structure variable.

ii. Explain the different parameter passing mechanisms with suitable examples.

15. a) Explain friend functions and friend class with suitable examples.

OR

b) Declare a class for storing the details of books. Include suitable constructor and methods for reading and printing the details.

16. a) With suitable example explain function overloading.

OR

b)With suitable examples explain different types of inheritance supported in C++.

17. a) Give detailed account of file processing n C++.

OR

b) Give a detailed account of STL.

(5 x 10 = 50 marks)

INSTRUCTIONS TO QUESTION PAPER SETTER							
Semester : 2				**Course : MCS2C06 JAVA PROGRAMMING**			
Section A				**Section B**			
Total no of questions	**Mark per question**	**No of questions to be answered**	**Time per question**	**Total no of questions**	**Mark per question**	**No of questions to be answered**	**Time per question**
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION

UNIT	SECTION A	SECTION B
1	2	1
2	3	1
3	3	1
4	2	1
5	2	1

Model Question

SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS2C06 JAVA PROGRAMMING

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. Explain JVM.
2. Explain type casting in Java.
3. With suitable example explain constructors.
4. What do you mean by method overloading?
5. What is the significance of Garbage collection?
6. What is a package?
7. What do you mean by runnable interface?
8. What is a deadlock in thread management?
9. What is an applet?
10. What is AWT?
11. What is an event?
12. What is a stored procedure?

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. (a) Give a detailed account of control statements in Java.

Or

(b)i. List and explain important features of Java.
ii. Write a Java program to search a name in an array of names. (5+5)

14. (a) i. Differentiate between Class and Interface.
ii. Describe the following methods: replace, compareTo and charAt. (5+5)

Or

(b) With suitable examples explain Inheritance.

15. (a) Give a detailed account of exception handling in Java.

Or

(b) i. Explain how to create a package with suitable example.
ii. Write a program to create two threads, one thread will print odd numbers and second thread will print even numbers between 1 to 20 numbers. (5+5)

16. (a) Explain Applet life cycle.

Or

(b) Discuss AWT controls.

17. (a) Give a detailed account of event handling.

Or

(b) Discuss JDBC architecture.

(5 x 10 = 50 marks)

<table>
<tr><th colspan="8">INSTRUCTIONS TO QUESTION PAPER SETTER</th></tr>
<tr><th colspan="8">Semester : 2 Course : MCS2C07 Data Structures & algorithms</th></tr>
<tr><th colspan="4">Section A</th><th colspan="2">Section B</th><th colspan="2"></th></tr>
<tr><th>Total no of questions</th><th>Mark per question</th><th>No of questions to be answered</th><th>Time per question</th><th>Total no of questions</th><th>Mark per question</th><th>No of questions to be answered</th><th>Time per question</th></tr>
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</table>

UNIT WISE DISTRIBUTION

UNIT	SECTION A	SECTION B
1	3	1
2	3	1
3	2	1
4	2	1
5	2	1

Model Question

SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS2C07 DATA STRUCTURES & ALGORITHMS

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. Write a function to concatenate tow singly Linked List.
2. Explain singly Linked List representation of polynomials.
3. With suitable example, explain the significance of Big Oh in algorithm analysis.
4. Give a class declaration for array based stack.
5. Define Tree and Binary Tree.
6. What is a priority Queue? Give any one application of it.
7. Differentiate red-Black tree and AVL tree.
8. Write a recursive function for the inorder traversal of a binary tree.
9. Differentiate Depth fist and Depth first approaches in graph traversal.
10. Discuss any two graph representation schemes.
11. Explain divide-and-Conquer strategy.
12. Give the basic principle of Quick sort.

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. **a)** Explain a scheme of representing Sparse Matrices. Write and explain a function to add two sparse matrices represented with your scheme. State your assumptions.

OR

b) i. Write a recursive function to reverse a Singly Linked List.

ii. Write a function to delete the ith node (if exist) froma singly Linked List.

iii. Write a function to delete first node from a Doubly Linked List. (3+4+3)

14. a) Explain Infix, Postfix and Prefix notations with examples. Write a complete program to convert an infix expression to postfix. Include class declarations and functions for stack operations.

OR

b) Write a Non-recursive function to traverse a Binary tree inorder. Include class declarations, functions for stack/Queue if employed. Comment on it time complexity.

15. a) What is a threaded Binary tree? Give its advantage. Write a function for inorder traversal of an Inorder Threaded Binary tree. Include appropriate class declarations.

OR

b) Explain Hashing. Discuss any three Collision Resolution techniques. Highlight advantages/limitations of each technique.

16. a) Explain shortest path problem. Write and illustrate with suitable example Dijkstra's algorithm.

OR

b) Define graph? List and explain any two applications of graph. Write a and explain Prim's algorithm. Illustrate with suitable example.

17. a) Write and explain necessary functions for Heap sort.

OR

b) Explain the principle of dynamic program. Write and explain Warshal's algorithm.

(5 x 10 = 50 marks)

INSTRUCTIONS TO QUESTION PAPER SETTER							
Semester : 2				Course : MCS2C08 DATABASE MANAGEMENT SYSTEMS			
Section A				Section B			
Total no of questions	Mark per question	No of questions to be answered	Time per question	Total no of questions	Mark per question	No of questions to be answered	Time per question
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION		
UNIT	SECTION A	SECTION B
1	3	1
2	3	1
3	2	1
4	2	1
5	2	1

Model Question

SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS2C08 DATABASE MANAGEMENT SYSTEMS

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. Given the following relations :

   EMP (Name, Eno, Deptno, Salary)
   DEPT (Deptno, Dname,Location)

   Write a query in SQL to find the name of the employee of each department who is getting highest salary.
2. Explain join operation in relational algebra.
3. Explain the difference between procedural and non-procedural DML
4. Differentiate between primary key, candidate key and super Key in ER model.
5. What is UML?
6. Explain the terms Assertion and Triggers.
7. Differentiate between Indexing and Hashing.
8. What do you mean by a transaction?
9. What do you mean by Distributed databases?
10. List any three differences between RDBMS and OODBMS.
11. List the data types in PostgreSQL.
12. What do you meant by aggregate function in pgSql

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. a) i. Discuss the salient features of Relational Model.

ii. Consider the following relation schemes:

Project (Project#, Project_name, chief_architect)
Employee (Emp#, Empname)
Assigned_To (Project#, Emp#)

Give expression in Tuple Relational calculus and Domain Relational calculus for each of the queries below:

(i) Get the employee numbers of employees who work on all projects.
(ii) Get the employee numbers of employees who do not work on the COMP123 project. (5+5)

OR

b) Explain the basic structure of SQL. With suitable example explain Set operations in SQL.

14. a)Give a detailed account of different Normal forms.

OR

b) Construct an ER diagram with all major components for a banking enterprise with entity sets customer, branch, loan, payment, account etc along with your own assumptions.

15. a) Explain the essential properties of transactions. Explain Concurrency control with examples.

OR

b) What is the significance of Hashing in DBMs? Give different Hashing schemes employed in DBMS.

16. a) Give a detailed account of Data warehousing.

OR

b)Discuss basic concepts, organization, advantages and major issues related to parallel databases

17. a) Give a detailed account of PostgreSQL administration.

OR

b) with suitable example explain postgreSQL programming.

(5 x 10 = 50 marks)

INSTRUCTIONS TO QUESTION PAPER SETTER

Semester : 2 **Course : MCS2C09 COMPUTER NETWORKS**

Section A				Section B			
Total no of questions	**Mark per question**	**No of questions to be answered**	**Time per question**	**Total no of questions**	**Mark per question**	**No of questions to be answered**	**Time per question**
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION

UNIT	SECTION A	SECTION B
1	3	1
2	2	1
3	2	1
4	2	1
5	3	1

Model Question

SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS2C09 COMPUTER NETWORKS

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. List four main applications of Internet.
2. What are the features of an optical fiber?
3. List the services provided by Data Link Layer.
4. Write a note on simplex stop-and-wait protocol.
5. What is fast Ethernet?
6. Compare and contrast Pure ALOHA and Slotted ALOHA.
7. Write short notes on hierarchical routing.
8. Explain Flooding.
9. What is Cryptography?
10. Write short notes on Simple Transport Protocol.
11. Write the functions of LLC.
12. What is the difference between connection oriented communication and connectionless communication.

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. (a) Discuss OSI reference model as network architecture.

Or

(b)Discuss LAN, WAN, MAN with respect to speed, coverage (area) and topology.

14. (a) Explain the sliding window protocol in detail.

Or

(b) Compare and contrast error detection with error correction.

15. (a) Discuss the frame format for 802.3 LAN.

Or

(b) Discuss CSMA/CD protocol used in LAN .

16. (a) What is an IP address? Explain the different classifications of IP address.

Or

(b) Discuss any four methods of congestion control in datagram subnets.

17. (a) Explain about the TCP header and working of the TCP protocol.

Or

(b) What is UDP? Explain the structure of UDP header?

(5 x 10 = 50 marks)

INSTRUCTIONS TO QUESTION PAPER SETTER							
Semester : 2	**Course : MCS2C10 FORMAL LANGUAGES AND FINITE AUTOMATA**						
Section A				**Section B**			
Total no of questions	**Mark per question**	**No of questions to be answered**	**Time per question**	**Total no of questions**	**Mark per question**	**No of questions to be answered**	**Time per question**
12	3	10 10 x 3 = 30	5 to 8 minutes	5 either-or questions - each containing two parts - (a) and (b)	10 marks per each part 5 x 10 = 50	All five questions selecting one part from each question	20 to 25 minutes

UNIT WISE DISTRIBUTION		
UNIT	**SECTION A**	**SECTION B**
1	3	1
2	3	1
3	3	1
4	2	1
5	1	1

Model Question

SECOND SEMESTER M Sc Computer Science DEGREE EXAMINATION

MCS2C10 FORMAL LANGUAGES AND FINITE AUTOMATA

Time: 3 Hrs **Max Marks: 80**

Section A

Answer any ten questions. Each question carries three marks.

1. Define NFA and DFA.
2. Differentiate between transducers and acceptors.
3. Define Language and Grammar.
4. Define Regular grammar. Give example.
5. Write Regular expression for the language on {0,1} '*all strings ending in 01*'.
6. Explain Parsing with suitable example.
7. Define CNF and GNF.
8. Differentiate between PDA and DFA.
9. Define Deterministic PDA.
10. What do you mean by a context free Language? Give example.
11. Define standard Turing machine.
12. What is a Linear Bounded Automata?

(10 x 3 = 30 marks)

Section B

Answer all questions. Each question carries ten marks.

13. (a) i. Prove that. If a regular language L is accepted by an NFA then there exists a DFA to accept L.

ii. Find a DFA for the language on $\Sigma = \{a, b\}$ $L = \{w: |w| \bmod 2 = 0\}$ (7+3)

Or

(b)i. With suitable example illustrate how number of states in a Finite Automaton can be reduced.

ii. Find a grammar for $\Sigma = \{a, b\}$ that generate the sets of all string's with no more than two a's. (7+3)

14. (a) i. Prove that $L=\{0^i1^j / i>j\}$ is not regular using pumping lemma.

ii. Define derivation tree. With an example explain leftmost and rightmost derivation.

(6+4)

Or

(b) i. Define regular language and regular grammar.

ii. Define context free grammar. With suitable example explain ambiguity in grammar.

(4+6)

15. (a) i. Remove useless and unit productions from the grammar $S\rightarrow Aa/ B$, $B\rightarrow A/bb$, $A\rightarrow a/bc/B$.ii. Convert the grammar with productions $S\rightarrow ABa$, $A\rightarrow aab$, $B\rightarrow Ac$. to Chomsky Normal Form.

(5+5)

Or

(b) i. Construct an NPDA for the language. $L=\{w\in\{a,b\}^* : n_a(w) = n_b(w)\}$.

ii. Prove that for any context free language L, there exists an NPDA M such that L=L(M).

(5+5)

16. (a) State and prove pumping lemma for Context free Languages.

Or

(b)With suitable example explain how Turing machine can be implemented as a Transducer.

17. (a) Explain i. Nondeterministic Turing Machine ii. Universal Turing Machine.

Or

(b) Discuss limits of algorithmic computation.

(5 x 10 = 50 marks)

KANNUR UNIVERSITY

(Abstract)

M A Programme in English Language & Literature Programme under Credit Based Semester System in affiliated colleges – Revised Scheme, Syllabus and Pattern of Question Papers -Implemented with effect from 2016 admission- Orders issued.

ACADEMIC C SECTION

UO.No.Acad/C3/ 13141/2014 Civil Station P.O, Dated,15 -07-2016.

Read : 1. U.O.No.Acad/C1/ 11460/2013, dated, 12-03-2014, 05.12.2015 & 22.02.2016.
2. U.O of even No dated 20.10.2014
3. Meeting of the Board of Studies in English(PG) held on 06-05-2016.
4. Meeting of the Board of Studies in English(PG) held on 17-06-2016.
5. Letter dated 27.06.2016 from the Chairman, Board of Studies in English(PG)

ORDER

1. The Regulations for P.G Programmes under Credit Based Semester System were implemented in the University with effect from 2014 admission vide paper read (1) above dated 12.03.2014 & Certain modifications were effected to the same dated 05.12.2015 & 22.02.2016 respectively.

2. As per paper read (2) above, the Scheme , Syllabus & Pattern of question papers for M A Programme in English Language and Literature under Credit Based Semester System in affiliated Colleges were implemented in the University w.e.f. 2014 admission.

3. The meeting of the Board of Studies in English(PG) held on 06-05-2016 , as per paper read (3) above, decided to revise the syllabus for M A Programme in English Language and Literature w.e.f. 2016 admission & as per paper read (4) above the Board of Studies finalized and recommended the scheme, syllabus and Pattern of question papers for M A Programme in English Language and Literature for implementation with effect from 2016 admission.

4. As per the paper read (5) above, the Chairman, Board of Studies in English (PG) has forwarded the finalized copy of the Scheme , Syllabus & Pattern of question Papers for M A Programme in English Language and Literature for implementation with effect from 2016 admission.

5.The Vice-Chancellor, after considering the matter in detail, and in exercise of the powers of the Academic Council, as per Section 11 (1) of Kannur University Act, 1996 and all other enabling provisions read together with, has accorded sanction to implement the revised Scheme , Syllabus & Pattern of question Papers for M A Programme in English Language and Literature as recommended by the Board of Studies, under Credit Based Semester System in affiliated colleges with effect from 2016 admission.

P.T.O.

6.Orders are therefore issued, implementing the revised Scheme , Syllabus & Pattern of Question Papers for M A Programme in English Language and Literature under Credit Based Semester System in affiliated Colleges with effect from 2016 admission, subject to report to the Academic Council.

7.The implemented Scheme, Syllabus & Pattern of Question Papers are appended here with.

Sd/-

JOINT REGISTRAR (ACADEMIC)

For Registrar

To:

The Principals of Affiliated Colleges Offering MA English Language and Literature Programme.

Copy to:

1.The Examination Branch
2. The Chairman, Board of Studies in English (PG)
3. PS to VC/PA to PVC/PA to Registrar/PA to CE.
4. JR/AR-I (Academic).
5.The Computer Programmer (with a request to upload the Website)
6. SF/DF/FC

Forwarded /By Order

SECTION OFFICER

- For more details log on to www kannur university.ac.in

APPENDIX TO U.O.NO.ACAD/C3/13141/2014 DATED 15.07.2016

KANNUR UNIVERSITY

M. A. PROGRAMME IN ENGLISH LANGUAGE AND LITERATURE

CREDIT BASED SEMESTER SYSTEM IN AFFILIATED COLLEGES

REVISED SCHEME & SYLLABUS

2016 ADMISSION ONWARDS

M. A. PROGRAMME IN ENGLISH LANGUAGE AND LITERATURE (CCSS)

REVISED SYLLABUS – 2016 ADMISSION ONWARDS

(To be followed in the affiliated colleges under Kannur University)

SEMESTER 1—Four Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
I	ENG 1C01	British Literature: Chaucer to Seventeenth Century	20	80	100	4	5
	ENG 1C02	British Literature: Eighteenth Century	20	80	100	4	5
	ENG 1C03	Literary Criticism	20	80	100	4	5
	ENG 1C04	History and Structure of English Language	20	80	100	4	5
	ENG 1E01 ENG 1E02 ENG 1E03	**Elective** (Choose one among three) Malayalam Literature in Translation Media Studies English Language Teaching	20	80	100	4	5
	TOTAL		**100**	**400**	**500**	**20**	**25**

SEMESTER 2—Three Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
II	ENG 2C05	Literature of the Romantic Period	20	80	100	4	7
	ENG 2C06	Literature of the Victorian Period	20	80	100	4	7
	ENG 2C07	Modern Literary Theory	20	80	100	4	6
	ENG 2E04 ENG 2E05 ENG 2E06	**Elective** (Choose one among three) Translation Studies World Drama Dalit Writings	20	80	100	4	5
	TOTAL		**80**	**320**	**400**	**16**	**25**

SEMESTER 3—Four Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
III	ENG 3C 08	Twentieth Century British Literature	20	80	100	4	6
	ENG 3C09	Linguistics	20	80	100	4	4
	ENG 3C10	Indian Writing in English	20	80	100	4	5
	ENG 3C11	American Literature	20	80	100	4	6
	ENG 3E07 ENG 3E08 ENG 3E09	**Elective** (Choose one among three) Introduction to Cultural Studies European Fiction Introduction to Comparative Literature	20	80	100	4	4
	TOTAL		**100**	**400**	**500**	**20**	**25**

SEMESTER 4—Six Core Courses including Project Work and Viva-voce

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
IV	ENG 4C 12	Postcolonial Writings	20	80	100	4	6
	ENG 4C 13	Women's Writing	20	80	100	4	6
	ENG 4C 14	Film Studies	20	80	100	4	6
	ENG 4C 15	Comprehension	20	80	100	4	4
	ENG PR 16	Project	20	80	100	4	3
	ENG 4C 17	Viva-Voce	00	100	100	4	0
	TOTAL		**100**	**500**	**600**	**24**	**25**

Details of Marks, Credit and Hours

Internal Assessment	380 (Maximum 20 marks for a course. Test Paper: 5 Marks; Assignment: 5 Marks; Seminar/Viva: 5 Marks Attendance: 5 Marks) Comprehension Course Internal (20 marks oral test)
External Evaluation	1620
Total Marks	2000
Total Credits	80
Total Hours	25 per week

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REVISED SYLLABUS – 2016 ADMISSION ONWARDS

(To be followed in the affiliated colleges under Kannur University)

SEMESTER 1—Four Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
I	ENG 1C01	British Literature: Chaucer to Seventeenth Century	20	80	100	4	5
	ENG 1C02	British Literature: Eighteenth Century	20	80	100	4	5
	ENG 1C03	Literary Criticism	20	80	100	4	5
	ENG 1C04	History and Structure of English Language	20	80	100	4	5
	ENG 1E01 ENG 1E02 ENG 1E03	**Elective** (Choose one among three) Malayalam Literature in Translation Media Studies English Language Teaching	20	80	100	4	5
	TOTAL		**100**	**400**	**500**	**20**	**25**

ENG 1C01

BRITISH LITERATURE: CHAUCER TO SEVENTEENTH CENTURY

Module 1

Background

English Renaissance and Religious Reformation
Geographical Explorations
Puritan Interregnum and Restoration Literature
Romantic comedy, Comedy of Manners, Comedy of Humours

Module 2-Poetry

Detailed

Sir Philip Sydney : Sonnet No.1 from *Astrophel and Stella*
William Shakespeare : Sonnet 60, Like the waves make towards the pebbled shore
Sonnet 55 ‘Not marble nor the gilded monuments’
Edmund Spenser : Prothalamion
John Donne : A Valediction Forbidding Mourning, Death Be Not Proud (Holy Sonnet X)
Andrew Marvell : To His Coy Mistress

Non-Detailed

Geoffrey Chaucer : *The General Prologue to The Canterbury Tales* (lines 1-100) in Middle English
Robert Herrick : To the Virgins to Make Much of Time
George Herbert : The Collar
Katherine Philips : A Married State

John Bunyan : Upon Over-Much Niceness

John Milton : Paradise Lost Book IX
John Dryden : Mac Flecknoe

Module 3

Prose

Francis Bacon : Of Superstition
Margaret Cavendish : The Description of a New World, Called The Blazing World
John Locke : The Epistle to the Reader from *An Essay Concerning Human Understanding* (Para 1, 2 & 3)
Aphra Behn : *Ornooko*; or, *The Royal Slave* (Norton Anthology Vol. C, pp. 2313 to 2329)
Samuel Pepys : The Great fire from *The Diary* (September 2, 1666)

Module 4

Drama

William Shakespeare : *Hamlet* **(Detailed)**
Christopher Marlowe : *Doctor Faustus*
William Congreve : *The Way of the World*

Suggested Reading

The Norton Anthology of English Literature (Topics: The Middle Ages, 16th Century, Early 17th Century)
A. W. Ward, A. R. Waller (Eds.) *The Cambridge History of English Literature*
Arthur F Kinney *The Cambridge Companion to English Literature, 1500-1600*
John Lennard *The Poetry Handbook*
Margaret Drabble *The Oxford Companion to English literature*
A. R. Braunmuller *The Cambridge Companion to English Renaissance Drama*
John E. Stevens *Medieval Romance: Themes and Approaches*
Deborah Payne Fisk *The Cambridge Companion to English Restoration Theatre*
G.Wilson Knight *The Wheel of Fire: Interpretations of Shakespearean Tragedy*
Thomas N. Corns *The Cambridge Companion to English Poetry, Donne to Marvell*
George Parfitt *English Poetry of the Seventeenth Century, 1590-1700*
Kalyani Vallath *A Contemporary Encyclopedia of British Literature, Vol I*
Web Resources:
http://www.bartleby.com/cambridge (The Cambridge History of English and American Literature—An Encyclopedia in Eighteen Volumes)
Literature.org (The Online Literature Library)

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4 (4 X 5 = 20 marks)

ENG 1C02

BRITISH LITERATURE: EIGHTEENTH CENTURY

Module 1

Bakground

The Age of Enlightenment
Urbanisation and Industrialisation of England
Periodical Literature
The Rise of the Novel

Module 2

Poetry (Detailed)

Anne Finch : A Nocturnal Reverie
Alexander Pope : The Rape of the Lock (Canto 2)
William Collins : Ode to Evening
William Blake : The Tyger; The Lamb

(Non-Detailed)

Robert Burns : To a Mouse
Oliver Goldsmith : The Deserted Village (lines 1 to 96)
Thomas Gray : Elegy Written in a Country Church-yard

Module 3

Prose and Novel

Jonathan Swift : Gulliver's Travels
Henry Fielding : Tom Jones
Daniel Defoe : Robinson Crusoe
Richard Steele : The Spectator's Club (The Spectator No. 2)
Charles Lamb : Dream Children; Old China

Module 4

Drama

Oliver Goldsmith : She Stoops to Conquer **(Detailed)**
Richard Sheridan : The Rivals

Suggested Reading

Paul Poplawski *English Literature in Context.*
The Norton Anthology of English Literature. (Topics: Restoration and the Eighteenth Century)
Eds. A. W. Ward, A. R. Waller *The Cambridge History of English Literature*
Richard W. Bevis English Drama *Restoration and Eighteenth Century, 1660-1789*
John Richetti *The Cambridge Companion to the Eighteenth-Century Novel*
Clive T. Probyn *English Fiction of the Eighteenth Century, 1700-1789*
Adrian Poole *The Cambridge Companion to English Novelists*
Ian Watt *The Rise of the Novel: Studies in Defoe, Richardson and Fielding*
Margaret Drabble *The Oxford Companion to English Literature*
John Sitter *The Cambridge Companion to Eighteenth-Century Poetry*
Web Resources:

http://www.bartleby.com/cambridge (The Cambridge History of English and American Literature—An Encyclopedia in Eighteen Volumes)
Literature.org (The Online Literature Library)

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Four out of six annotation questions (80 words) from the poems and drama prescribed for detailed study in Module 2 and Module 4 respectively. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

ENG 1C03
LITERARY CRITICISM

Module 1
Introduction to:
1. Classical Criticism and Neoclassical Criticism
2. Philosophical roots of Romanticism
3. British Romanticism
4. Objective Criticism

Module 2
Suresh Joshi : On Interpretation (From Indian Literary Criticism-GN Devy)
Aristotle : *Poetics*
Longinus : *On the Sublime*
Philip Sidney : *Apology for Poetry**
John Dryden : Essay of Dramatic Poesy*
Dr Johnson : Preface to Shakespeare*

Module 3
William Wordsworth : Preface to Lyrical Ballads*
S.T. Coleridge : Biographia Literaria (ch14 &17)*

Module 4
Mathew Arnold : The study of Poetry*
Walter Pater : From Studies to the History of Renaissance

(in *Norton Anthology of Theory & Criticism*)
*(in D.J.Enright & Ernst De Chickera, *English Critical Texts*)

Suggested Reading

M.H. Abrams *The Mirror and the Lamp* (Ch.1)

Harry Blamiers *A History of Literary Criticism*
M.S. Nagarajan *English Literary Criticism and Theory*
William K. Wimsatt & Cleanth Brooks *Literary Criticism: A Short History*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Eight out of ten paragraph questions (100 words) from all modules
(8 X 5 = 40 marks)

ENG 1C04
HISTORY AND STRUCTURE OF ENGLISH LANGUAGE

Module 1
Introduction

The indo-European family of languages – The Teutonic/Germanic family – place of English in the family – Origin and important landmarks in the history of English language.

Module 2
The Old English Period

The birth of Old English –Dialects – Characteristic features – Vocabulary and grammar– Literature.

Module 3
The Middle English Period

The Norman Conquest – General characteristics – Grammar and vocabulary – Dialects – Foreign influences and borrowings (Celtic, Latin, Greek, French, Scandinavian) – Evolution of Standard English – Middle English Literature.

Module 4
The Modern English Period

The making of modern English – Influence of Renaissance, Printing, and Bible Translations – Grammar and vocabulary changes – Individual contributions of Shakespeare—Milton.

Module 5
Contemporary English Language

English as a Global language – Varieties (RP, US, Chinese, and Indian) – Pidgin, Creole – Computer, internet and the spread of English language – English as global lingua franca.

Suggested Reading

Albert C. Baugh *A History of the English Language*
C.L. Wren *The English Language*
George Leslie Brooks *English Dialects*

Otto Jespersen *Growth and Structure of the English Language*
George Yule *The Study of Language, 5th Edition*
Randolph Quirk *The Use of English*
Logan P. Smith *The English Language*
David Crystal *Language Death*
Patricia Friedrich, Eduardo H. Diniz De Figueiredo: *The Sociolinguistics of Digital Englishes*
Jack C. Richards *New Varieties of English: Issues and Approaches*

Question paper pattern
Duration: 3 Hrs

Maximum Marks: 80

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Eight out of ten paragraph questions (100 words) from all modules.
(8 X 5 = 40 marks)

ENG 1E01
MALAYALAM LITERATURE IN TRANSLATION

Module 1
Background

V. Aravindakshan : “The Literary Tradition of Kerala” (from *Essays on the Cultural Formation of Kerala* Ed. P.J. Cherian, Kerala State Gazetteer, Vol. IV, Part II, 1999, pp. 65-98
N.P. Mohamed : “Short in Genre, Long in History” (*Indian* Literature, Vol. 36, No. 3, May-June 1993, pp. 182-186)
Sunny M. Kapikkad : “The Dalit Presence in Malayalam Literature” (*The Oxford India Anthology of Malayalam Dalit Writing* by M Dasan et al)

Module 2
Poetry
Detailed

Kumaran Asan : The Fallen Flower
Ullur : Music of Lovens (Trans. C.A. Joseph)
Vylopilli : The Tear-Fields (Trans. V.C. Harris)
O.N.V. Kurup : Blue Fish (Trans. K.M.George)
Vijayalakshmi : Bhagavatham (Trans. Satchidanadan, Haritham)

Non-Detailed

S. Joseph : Group Photo (Trans. Satchidanadan, in Dasan et al)
Sugatha Kumari : Colossus
Veerankutty In the Sanatorium for Trees (Trans. K.M.

Sherrif)

Thottam Pattu : Thottam on Pottan – Section I (Trans. K.M. Tharakan, in *The Sacred in Popular Hinduism* by A. A. Abraham, Pub. The Christian Literature Society, Madras, 1983, pp. 170-177)

Module 3
Fiction

O. Chandu Menon : *Indulekha* (Trans. Anitha Devasia, OUP)
Thakazhi : *Chemmeen* (Trans. T.S. Pillai)
Basheer : Me Grandad 'ad an Elephant (Trans. R.E. Asher, Mathrubhoomi Books)
O.V. Vijayan : *The Legends of Khasak* (Author, Penguin)
N.S. Madhavan : "The Fourth World" (Trans. A.J. Thomas, *Indian* Literature, Vol. 36, No. 3, May-June 1993, pp. 111-122)
M.T. Vasudevan Nair : "Sherlock" (Trans. Gita Krishnankutty, Penguin)
Sarah Joseph : "Inside Every Woman Writer" (Trans. V.C. Harris, *Indian* Literature, Vol. 36, No. 3, May-June 1993, pp. 94-100)
Sithara S : "Fire" (Trans. R.K. Jayasree, Women Unlimited)

Module 4
Drama

G. Sankara Pillai : *Bharathavakyam* **(Detailed)**
K.J. Baby : *Nadugadhika* (Trans. Shirly M. Joseph))

Suggested Reading

K M Tharakan (Ed.) *Malayalam Poetry Today: An Anthology*.
K.M. George (Ed.) *A Survey of Malayalam Literature*
Rita Kothari *The Cultural Politics of English*
E.V. Ramakrishnan *Locating Indian Culture: Texts, Traditions, Translations*
Malayalam Literary Survey (English journal on Malayalam Literature, published by Sahithya Akademi, Thrissur)

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Four out of six annotation questions (80 words) from the poems and drama prescribed for detailed study in Module 2 and Module 4 respectively. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

ENG 1E02
MEDIA STUDIES

Module I
Background

Mass Media—main effects and functions.
Media Culture
Media in transition
Cyberculture
The Psychodynamics of social networking

Module 2

From orality to print—print media—the technologising of the word—the rise of modern mass media—reconfiguring of narratives—the mediasation of culture—media effects—folk and traditional media-books—pamphlets—magazines--newspapers—advocacy journalism–broadcast journalism—citizen journalism—participatory journalism—data journalism—drone journalism—gonzo journalism---interactive journalism—investigative journalism--photojournalism—sensor journalism—tabloid journalism or yellow journalism (or sensationalism).

Module 3

Hypertext—theatre and theatricality—the rise of popular sensationalism—culture industry—media and advocacy—infotainment—docutainment—internet culture—low culture—mediated communication—social values—media ecology—representation, technologies of representation and new media; media production—mainstream media and alternative media.

Module 4

Digital media—Internet and mobile mass communication—Video games—Audio recording and reproduction—Blogs--RSS feeds—Podcasts—email—social media sites, websites and Internet-based radio and television—linking to or running TV ads online, or distributing QR codes in outdoor or print media—narrative form in mass broadcast media—electronic transmission of information—film, radio, recorded music, television. Outdoor media—AR advertising; billboards; blimps; flying billboards placards—kiosks—cross-media-software publishing—professional and ethical issues and criticism.

Suggested Reading

Marshall McLuhan, *Understanding Media: The Extensions of Man.*

James Carey, "Mass Communication and Cultural Studies," in *Communication as Culture: Essays on Media and Society*

William J. Mitchell, "How to Do Things with Pictures," in *The Reconfigured Eye: Visual Truth in the Post-Photographic Era.*

John Fiske and John Hartley, "Bardic Television," in *Reading Television.*

David Thorburn, "Television as an Aesthetic Medium," *Critical Studies in Mass Communication* 4 (1987), 167-173.

Walter J. Ong, "Some Psychodynamics of Orality," in *Orality and Literacy: the technologizing of the word.*

George Landow, "Reconfiguring Narrative," *Hypertext*
Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction," in *Illuminations* (New York, 1969)
Leo Charney and Vanessa R. Schwartz (ed.) *Cinema and the Invention of Modern Life*
Tom Gunning, "An Aesthetic of Astonishment: Early Film and the (In)Credulous Spectator," in Linda Williams (ed.*) Viewing Positions: Ways of Seeing Film*
Pierre Bourdieu *On Television*
Uttara Manohar *Different Types of Mass Media*
Slavko Splichal,. *"In Pursuit of Socialized Press". In Berry, David & Theobald John.Radical Mass Media Criticism: A Cultural Genealogy.*
John Nerone *"Approaches to Media History". In Valdivia, Angharad N. A Companion to Media Studies.*
Asa Briggs, & Peter Burke *Social History of the Media: From Gutnberg to the Balkaran,* Stephen *(October 1999).* "Mass Media and Racism" *The Yale Political Quarterly.*
John *R* Downing (Ed.) *The SAGE Handbook of Media Studies.*
Nicholas John Cull, David Culbert and David Welch, eds. *Mass Persuasion: A Historical Encyclopedia, 1500 to the Present*
Pieter Fourie J *Media Studies: Media History, Media and Society.*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Eight out of ten paragraph questions (100 words) from all modules
(8 X 5 = 40 marks)

ENG 1E03
ENGLISH LANGUAGE TEACHING

Module 1: History, Theory, and Practices of ELT

History of English Language Teaching – Major approaches and methods in ELT –Teaching LSRW skills – English for specific purposes – Teaching English in multilingual societies – Research Trends in second language acquisition.

Module 2: Recent Trends in ELT

Major trends in twentieth-century ELT practices–ICT and Communication–CT Tools–Internet, smart phones, smart classroom, web resources, online teaching, learning, and assessment, e-content development, e-publishing, education portals – Developing blogs and websites – Free online services (MOOC, Edx, Coursera).

Module 3: ELT in India

Teaching of English in India – Objectives, methods and materials – Problems and solutions – status of English in India – Link language and official language –Language policies of the government.

Module 4: The Politics of ELT

Braj B. Kachru	"English as an Asian Language"
Robert Phillipson	"The colonial linguistic inheritance" (Chapter 5 of *Linguistic Imperialism*)
A. Suresh Canagarajah	"Resistance to English in historical Perspective" (Chapter 3 of *Resisting Linguistic Imperialism in English Teaching)*

Suggested Reading

H. H. Stern	*Fundamental Concepts of Language Teaching*
A. P. R. Howatt	*A History of English Language Teaching*
Wilga Rivers	*Teaching Foreign Language Skills.*
S. Krashen	*Principles and Practice in Second Language Learning*
Richards and Rodgers	*Approaches and Methods in Language Teaching.*
R. K. Agnihotri & A. L. Khanna	*English Language Teaching in India.*
David P. Harris	*Teaching English as a Second Language*
Y. P. Lee	*New Directions in Language Testing*
Harold V. Allen	*Teaching English as a Second Language*
Geoffrey Leech & Christopher	*Computers in English Language Teaching and Research*
N. S. Prabhu	*Second Language Pedagogy*
Jack. C. Richards and Theodore Rodgers	*Approaches and Methods in Language Teaching*
Sashi Ghosh & Das	*Introduction to English Language Teaching Vol. 3 Methods at the College Level, OUP*
Robert Phillipson	*Linguistic Imperialism*
Suresh A. Canagarajah	*Resisting Linguistic Imperialism in English Teaching*

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

SEMESTER 2—Three Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
II	ENG 2C05	Literature of the Romantic Period	20	80	100	4	7
	ENG 2C06	Literature of the Victorian Period	20	80	100	4	7
	ENG 2C07	Modern Literary Theory	20	80	100	4	6
	 ENG 2E04 ENG 2E05 ENG 2E06	**Elective** (Choose one among three) Translation Studies World Drama Dalit Writings	20	80	100	4	5
	TOTAL		**80**	**320**	**400**	**16**	**25**

ENG 2C05
LITERATURE OF THE ROMANTIC PERIOD

Module 1
Background

The French Revolution and its impact on English literature
Class, Power and Politics
Nationhood and Empire
The abolition of slavery—Slave narratives

Module 2
Poetry

(Detailed)

William Wordsworth : Intimations of Immortality
ST Coleridge : Frost at Midnight
Lord Byron : She Walks in Beauty
PB Shelley : Mutability
John Keats : Ode to a Nightingale

(Non-Detailed)

William Wordsworth : A Poet's Epitaph
Thomas Gray : Elegy Written in a Country Church-yard
Robert Southey : After Blenheim
ST Coleridge : The Rime of the Ancient Mariner
Walter Scott : County Guy

Module 3
Prose

Olaudah Equiano : The Interesting Narrative (from Chapter 4 and 5; pp. 102-105, The Norton Anthology. (Vol. D)
Mary Wollstonecraft : From A Vindication of the Rights of

Woman (Introduction: Norton Anthology;
(Vol. A)
Thomas De Quincey : On the Knocking at the Gate in Macbeth

Module 4
Novel
Jane Austen : *Mansfield Park*

Mary Shelley : *Frankenstein*
Walter Scott : *Ivanhoe*

Suggested Reading:
Norton Anthology of English Literature. The Romantic Period (Volume D)
Paul Poplawski *English Literature in Context*
Thomas Keymer *The Cambridge Companion to English Literature, 1740–1830*
C.M. Bowra *The Romantic Imagination*
Nicholas Roe *Romanticism: An Oxford Guide*
Stuart Curran *The Cambridge Companion to British Romanticism*
Fred Botting *Gothic*
James Chandler *The Cambridge Companion to British Romantic Poetry*
James Chandler *The Cambridge History of English Romantic Literature*
Aidan Day *Romanticism*
Lucy Newlyn *The Cambridge Companion to Coleridge*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

ENG 2C06
LITERATURE OF THE VICTORIAN PERIOD

Module 1
Background
Reform and Society
The Consumption of Literature and the Literary Marketplace
Science, Nature and Crises of Faith
Victorian Morality and the Decay of Values

Module 2

Poetry (Detailed)

Elizabeth Barrett Browning : Sonnet 22
Alfred Tennyson : Ulysses
Matthew Arnold : Dover Beach
GM Hopkins : As Kingfishers Catch Fire
Pied Beauty

(Non-Detailed)

Robert Browning : Andrea del Sarto
Christina Rossetti : When I am dead, my dearest
DG Rossetti : The Blessed Damozel
Thomas Hardy : The Darkling Thrush
Robert Bridges : So Sweet Love Seemed That April Morn

Module 3

Prose and Fiction

Charles Darwin : *The Origin of Species* (From Chapter 15. Recapitulation and Conclusion)
Arthur Conan Doyle : The Speckled Band
Geroge Eliot : *The Mill on the Floss*
Charlotte Bronte : *Jane Eyre*
Charles Dickens : *A Tale of Two Cities*
Thomas Hardy : *The Mayor of Casterbridge*

Module 4

Drama **(Detailed)**

Oscar Wilde : *The Importance of Being Earnest*

Suggested Reading

Norton Anthology of English Literature Vol. E
Robin Gilmour *The Victorian Period: The Intellectual and Cultural Context of English Literature, 1830-1890*
Robin Gilmour *The Novel in the Victorian Age: A Modern Introduction*
Joanne Shattock. *The Cambridge Companion to English Literature, 1830–1914*
William E. Buckler *The Victorian Imagination: Essays in Aesthetic Exploration*
Deirdre David. *The Cambridge Companion to the Victorian Novel*
Jerome H Buckley *The Victorian Temper: A Study in Literary Culture*
Francis O'Gorman *The Cambridge Companion to Victorian Culture*
Joseph Bristow *The Cambridge Companion to Victorian Poetry*

Web Resources

www.victorianweb.org

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Four out of six annotation questions (80 words) from the poems and drama prescribed for detailed study in Module 2 and Module 4 respectively. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

ENG 2C07
MODERN LITERARY THEORY

Module1

T.S. Eliot : Tradition and Individual Talent
Cleanth Brooks : The Language of Paradox
Northrop Frye : Archetypal Criticism
Sigmund Freud : Creative Writers and Daydreaming

Module 2

Louis Althusser : Ideology and Ideological State Apparatus (Norton Anthology)
Susan Gubar : From The Madwoman in the Attic: The Woman Writer and the Nineteenth century Literary Imagination (Norton Anthology)

Module 3

Jacques Derrida : Structure, sign and Play in the Discourse of Human Sciences
Michel Foucault : From Discipline and Punish: The Birth of Prison (Norton Anthology of Theory & Criticism)

Module 4

Stephen Greenblatt : Resonance and Wonder
Ernst Renan : What is a Nation?
Jean- Francois Lyotard : Defining the Postmodern (In Norton Anthology)

Suggested Reading:

Terry Eagleton *Literary Theory: An Introduction*
Terry Eagleton *Ideology: An Introduction*
Patricia Waugh *Literary theory and Criticism*
David Lodge (ed.). *Twentieth Century Literary Criticism reader*
David Lodge (ed.). *Modern Criticism and Theory*
Raman Selden et al *A Reader's Guide to Contemporary Literary Theory*
V. S.Sethuraman(ed.) *Contemporary 'Criticism; An Anthology*
Jerome Neu *The Cambridge Companion to Freud*
Gill Plain & Susan Sellers (eds.) *A History of Feminist Literary Criticism*
Ellen Rooney *The Cambridge Companion to Feminist Literary Theory*
William J. Handy & Max Westbrook (eds.) *Twentieth Century Criticism*
Fred Rush *The Cambridge Companion to Critical Theory*
M.A.R. Habib *Modern Literary Criticism and Theory: A History*
Peter Collier & Helga Geyer-Ryan *Literary Theory Today*
Gary Gutting *The Cambridge Companion to Foucault*
Madan Sarup *An Introductory Guide to Post Structuralism and Post Modernism*

Dennin Walder *Literature in the Modern World*
Michael Groden & Martin Kreiswith (eds.) *The Johns Hopkins Guide to Literary Theory and Criticism*
Michael Kelly (Ed.) *Encyclopedia of Aesthetics Vols. 1, 2,3 and 4*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Eight out of ten paragraph questions (100 words) from all modules
(8 X 5 = 40 marks)

ENG 2E04
TRANSLATION STUDIES

Module 1
The growth and development of the discipline
Relevance of Translation Studies
Approaches to translation through the ages
The politics of translation

Module 2
Types of translation—The processes involved in translation—Transference, transliteration and transcreation—Problems involved in translation—Language varieties in translation—Machine translation

Module 3
Susan Bassnett : Culture and Translation
Roman Jakobson : On Linguistic Aspects of Translation
Sujit Mukherjee : A Link Literature for India :
Annie Brisset : The Search for a Native Language: Translation and Cultural Identity
Ayyappa Panikkar : "Contemporary Textual Politics: Translating a Sacred Text"

Module 4
Practical exercise in Translating prose passages from SL to English language. (Internal Assessment should be based on this. Two Thousand words in TL)

Suggested Reading
Piotr Kuhiwczak and Karinn Littau *A Companion to Translation Studies*
Lawrence Venuti (ed.) *The Translation Studies Reader*, (pp. 342-357)
Sujit Mukherjee *Translation as Discovery*
Susan Bassnett, *Translation Studies*
JC Catford *A Linguistic Theory of Translation*
BK Das *The Horizon of Translation Studies*
Routledge *Encyclopaedia of Translation Studies*.

Riccardi *Translation Studies: Perspectives on an Emerging Discipline*

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) Two essays of 350 words out of four from Module 3 (2 X 10 marks= 20 Marks)

II Eight out of ten paragraph questions (100 words) from all modules
(8 X 5 = 40 marks)

ENG2E05
WORLD DRAMA

Module 1
Background

History of Theatre (Classical Greek, Roman and Sanskrit)
Drama in Western and Eastern Cultures
The Elizabethan Theatre
Modern Theatre
Dramatic Form and Styles

Module 2

Sophocles	*Oedipus the King*
Kalidasa	*Abhijnana Sakuntalam*
William Shakespeare	*King Lear* **(Detailed)**

Module 3

Anton Chekhov	*Uncle Vanya*
Henrik Ibsen	*A Doll's House*
J.M. Synge	*The Playboy of the Western World*
Bertolt Brecht	*The Three Penny Opera* **(Detailed)**

Module 4

Eugene Ionesco	*The Killer*
Harold Pinter	*The Birthday Party*
Vijay Tendulkar	*Silence! The Court is in Session*
Ama Ata Aidoo	*The Dilemma of a Ghost* **(Detailed)**

Sugested Reading

Martin Banham *The Cambridge Guide to World Theatre*
Phyllis Hartnoll *The Oxford Companion to Theatre*
Eric Bentley *The Classic Theatre*
Oscar G. Brockett *The Theatre: An Introduction*
Ton Hoenselaars *The Cambridge Companion to Shakespeare and Contemporary Dramatists*
David Wiles *The Cambridge Companion to Theatre History*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Three out of six annotation questions (80 words) from the plays prescribed for detailed study in Module 2, 3 & 4. (3 X 5 = 15 marks)

III Five out of seven paragraph questions (100 words) from all modules (5 X 5 = 25 marks)

ENG 2E06
DALIT WRITINGS

Module 1
Background

Origins of Dalit literature:
Buddha (6th c.) Chokhamela (14 AD) Mahatma Phule (1828-1890)
Prof. S. M. Mate (1886-1957) Dr. Bheemrao Ramji Ambedkar (1891-1956)
Emergence of Dalit Literary Movement
Dalit aesthetics
Dalits and the Indian narrative-identity politics-social history-political assertion
Dalit poetry
Malayalam Dalit writing.

Module 2
Poetry

(Detailed)

Siddhalingaiah	The Dalits are Coming
Manohar Biswas	A Hut in a Segregated Compund
Pralhad Chendwankar	Empty Advice
Hira Bansode	Slave
Namdeo Dhasal	Man You should Explode
Devadevan	Infection

(Non-Detailed)

Rajkumar N.D	A Wish
Damodar More	Poetry Reading
Challappalli Swarupa Rani	Forbidden History
Pravin Gadhavi	Brainwash
Bapurao Jagtap	This Country is Broken
Jyoti Lanjewar	Caves

Module 3
Fiction/Autobiography

Bama	*Karukku-*
Narayanan	*Kocharethi-*
Om Prakash Valmiki	*Joothan*-
Baburao Ramchandra Bagul	“Mother” (From *Indian short stories, 1900–2000*, by E.V. Ramakrishnan, Sahitya Akademi, 2005. *Page 217.*)
Harish Mangalam	“The Midwife”
C.Ayyappan	“Madness”-

Module 4
Prose

Kancha Ilaiah	Contemporary Hinduism (From *Why I am Not a Hindu*- Chapter IV)
S.K. Limbale	Dalit Literature and Aesthetics (From *Towards an Aesthetic of Dalit Literature* Chapter VII).
B.R. Ambedkar	*Annihilation of Caste* Sections I-VI-.
	“Dalit Literature: Past, Present and Future” Arjun Dangle

Suggested Reading

Kancha Ilaih *Why I am not a Hindu*
James Massey *Roots: A Concise History of Dalits*.
D R Nagaraj *The Flaming Feet and Other Essays: The Dalit Movement in India*
Gail Omvedt *Dalit Visions: The Anti-Caste Movement and the Construction of an Indian Identity*
Arjun Dangle (Ed.) *Poisoned Bread.*
B.R. Ambedkar *Annihilation of Caste*
B.R. Ambedkar *Buddha, or Karl Marx.*
Sharmila Rege_*Writing Caste/Writing Gender: Reading Dalit Women's Testimonies.*
Gail Omvedt *Buddhism in India: Challenging Brahmanism and Caste*
Susie J. Tharu *No Alphabet in Sight: New Dalit Writing from South India*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Modules 2 (non-detailed poems), 3 & 4. (4 X 5 = 20 marks)

SEMESTER 3—Four Core Courses and one Elective (select one among three)

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
III	ENG 3C 08	Twentieth Century British Literature	20	80	100	4	6
	ENG 3C09	Linguistics	20	80	100	4	4
	ENG 3C10	Indian Writing in English	20	80	100	4	5
	ENG 3C11	American Literature	20	80	100	4	6
	ENG 3E07 ENG 3E08 ENG 3E09	**Elective** (Choose one among three) Introduction to Cultural Studies European Fiction Introduction to Comparative Literature	20	80	100	4	4
	TOTAL		**100**	**400**	**500**	**20**	**25**

ENG 3C08
TWENTIETH CENTURY BRITISH LITERATURE

Module 1
Background:

The Modernist Revolution (Anglo-American Modernism and the Celtic Modernism)
The Great War (I WW) and Literature
The Irish Nationalism and Literature
Modernist Poetry in English
A Survey of post-1950s British Literature

Module 2
Poetry:

Detailed

W.B. Yeats	The Second Coming, Easter 1916
TS Eliot	The Waste Land (Annotation questions only from section1: Burial of the Dead)
Wilfred Owen	Strange Meeting
Tom Gunn	On the Move
Ted Hughes	Pike

Non-Detailed

W.H.Auden	The Shield of Achilles
D.H. Lawrence	Snake
Dylan Thomas	Do not go Gentle into that Good Night
Philip Larkin	Ambulance
R.S. Thomas	Death of a Peasant
Seamus Heaney	The Tollund Man

Module 3
Drama:

Detailed

Samuel Beckett	Waiting for Godot

Non-Detailed

Harold Pinter	The Dumb Waiter
Bernard Shaw	Arms and the Man

Module 4
Fiction

James Joyce	A Portrait of the Artist as a Young Man
Virginia Woolf	Mrs. Dalloway
E.M. Foster	A Passage to India
John Fowles	The French Lieutenant's Woman

Suggested reading:

The Norton Anthology of English Literature: 20th Century
Peter Nicholls *Modernisms: A Literary Guide*
Alex Davis *The Cambridge Companion to Modernist Poetry*
Peter Childs *Modernism*
Santanu Das *The Cambridge Companion to the Poetry of the First World War*
Martin Esslin *The Theatre of the Absurd*
Robert L. Caserio *The Cambridge Companion to the Twentieth-Century English Novel*
Christopher Gillie *Movements in English Literature, 1900-1940*
Neil Corcoran *The Cambridge Companion to Twentieth-Century English Poetry*
David Lodge *The Modes of Modern Writing: Metaphor, Metonymy, and the Typology of Modern Literature*
Dennis Walder (ed.) *Literature in the Modern World: Critical Essays and Documents*
Marjorie Howes *The Cambridge Companion to W. B. Yeats*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2 and the detailed drama in Module 4.
(4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

ENG 3C09
LINGUISTICS

Module 1
Background

What is linguistics?
The Branches of linguistics: General, Descriptive, Historical, Theoretical and Applied
Introduction to Developmental linguistics, Sociolinguistics, Psycholinguistics and Neuro-

linguistics
Important Schools and Theorists: Prague, Copenhagen, London
American Structuralism—Saussure, Firth, Halliday, Sapir, Bloomfield and Chomsky

Module 2

Phonology

Basic concepts: Phone, Phoneme, Allophone
Speech Mechanisms; Classification of speech sounds: Vowels and Consonants
Supra segmental features: Stress, Pitch, Intonation

Module 3

Morphology

Morphological Processes Word classes: Form class and Function class
Morpho-phonemics: Addition, Elision, Assimilation
Fundamental word formation processes: Root-creation, Derivation, Compounding, Borrowing

Module 4

Syntax

Formal and functional labels
The structures of Phrases and Clauses
Structural grammar: IC Analysis, PS Grammar Transformational Generative Grammar (TG)
Competence and Performance. Deep Structure and Surface Structure, Ambiguity, Limitations.

Module 5

Semantics

The Concept of Meaning: Lexical and Grammatical; Denotative and Connotative; Situational and Contextual; Theme and Rhyme
Theories of Meaning: Hyponymy, Metonymy, Synonymy, Antonym, Entailment, Prototype
Discourse: Proposition, Presupposition, Entailment, Implication

Suggested reading:

John Lyons *Linguistics*
John Lyons *Language and Linguistics: An Introduction*
Georg Yuli *The Study of Language*
H A Gleason, Jr *Linguistics and English Grammar*
An Introduction to Descriptive Linguistics
Workbook in Descriptive Linguistics
Michael Ashby *Introducing Phonetic Science*
Roman Jakobson & Morris Halle *Fundamentals of Language*
David Odden *Introducing Phonology*
M. A. K. Halliday, Angus McIntosh & Peter Strevens *The Linguistic Sciences and Language Teaching*
Edward Sapir *Language: An Introduction to the Study of Speech*
Ron Cowan *The Teacher's Grammar of English*
Eugene A. Nida *A Synopsis of English Syntax*
Harold B. Allen *Readings in Applied English Linguistics*
George Oliver Curme *Syntax*
Noam Chomsky *Syntactic Structures*
James R. Hurford *Semantics: A Course Book 2/E*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4 or Module 5	(10 marks)

II Eight out of ten paragraph questions (100 words) from all modules
(8 X 5 = 40 marks)

ENG 3C10
INDIAN WRITING IN ENGLISH

Module I
Background

Growth of English in India
Poetry since Independence
Writing by the Indian Diaspora
Novel in the 1980s and 1990s

Module 2
Poetry
Detailed

Aurobindo	The Stone Goddess
Toru Dutt	Our Casuarina Tree
Nissim Ezekiel	Background Casually
Tagore	They Call You Mad
Eunice de Souza	Songs of Innocence

Non-Detailed

Dom Moraes	Wrong Address, Asleep
A.K.Ramanujan	Anxiety, The Guru
Vikram Seth	Flash
Imtiaz Dharkar	Gaddi aa Gayi

Module 3
Prose and Fiction

Partha Chatterjee	“Whose Imagined Community?” (From *The Nation and its Fragments: Colonial and Postcolonial Histories.* Princeton: Princeton UP, 1993.)
Aravind Adiga	*White Tiger*
Rohinton Mistry	*Such a Long Journey*
Amitav Ghosh	*The Shadow Lines*

Module 4
Drama
Detailed

Mahesh Dattani	*The Girl Who Touched the Stars*

(Non-Detailed)

Girish Karnad	*Tale Danda*

Suggested Reading
S.Z.H. Abidi *Studies in Indo-Anglian Poetry*
Shyam Asnani M *Critical Response to Indian English Fiction*
A.K. Mehrotra *A Concise History of Indian Literature in English*
Krishna S. Bhatta *Indian English Drama: A Critical Study*
O.P Bhatnagar,(Ed.) *Studies in Indian Poetry in English*
S.R. Desai and G.N. Devy *Critical Thought: An Anthology of 20th Century Indian English Essays*
Eunice De Souza and Silgardo Melanie (Ed.) *These My Words: The Penguin Book of Indian Poetry.*
Bruce King, *Modern Indian Poetry in English*
P Lal (Ed*.) Modern Indian Poetry in English: An Anthology and A Credo*.
E.N. Lall, *The Poetry of Encounter: Dom Moraes, A.K. Ramanujan and Nissim Ezekiel*
Ashley Myles E. (Ed.) *An Anthology of Indo-Anglian Poetry*
M.K. Naik (Ed.) *Perspectives on Indian Poetry in English*
Saleem Peeradina (Ed.) *Contemporary Indian Poetry in English: An Assessment and Selection*
Madhusudan Prasad (Ed*.) Indian English Novelists: An Anthology of Critical Essays*
P.P. Raveendran *Texts, Histories, Geographies: Reading Indian Literature*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2 and the detailed drama in Module 4.
(4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4. (4 X 5 = 20 marks)

ENG 3C11
AMERICAN LITERATURE

Module 1
Background

Early Puritan Settlement to 1900: The Multiple Contexts of American Literature.
Harlem Renaissance
Realistic Tragedy and 20th Century American Drama
American Literature since 1945

Module 2
Poetry
Detailed

Emerson	Brahma
Robert Frost	Christmas Trees
TS Eliot	"Little Gidding," from the Four Quartets
Sylvia Plath	Daddy
Allen Ginsberg	Howl (I section only)

Non-Detailed:

Walt Whitman	Passage to India
Emily Dickinson	I Measure Every Grief I Meet
EE Cummings	What if a much of a which of a wind
Ezra Pound	And the days are not full enough
John Ashberry	The one thing that can save America
Adrienne Rich	Cartographies of Silence

Module 3
Drama
Detailed

Eugene O'Neil	*Long Day's Journey into Night*

Non-detailed:

Tennessee Williams	*A Streetcar Named Desire*
Lorraine Hansberry	*A Raisin in the Sun*

Module 4
Prose

Henry David Thoreau	On the Duty of Civil Disobedience
Ralph Waldo Emerson	The Over-Soul
Ernest Hemingway	Death in the Afternoon (Chapter 1)

Fiction

Mark Twain	*Huckleberry Finn*
Herman Melville	*Moby Dick*
Tony Morrison	*The Bluest Eye*
Don Delillo	*White Noise*

Suggested Reading:

Norton Anthology of American Literature

Walter Kalaidjian	*The Cambridge Companion to American Modernism*
Joshua L. Miller	*The Cambridge Companion to the American Modernist Novel*

Alan Shucard et al	*Modern American Poetry 1865-1950*
Timothy Parrish	*The Cambridge Companion to American Novelists*
Mark Richardson	*The Cambridge Companion to American Poets*
Ed. A. Robert Lee	*Nineteenth-Century American Poetry*
Jennifer Ashton	*The Cambridge Companion to American Poetry since 1945*
John N. Duvall	*The Cambridge Companion to American Fiction after 1945*

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4 (Fiction only)	(10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2 and the detailed drama in Module 3. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3 and Module 4 (Prose selections only). (4 X 5 = 20 marks)

ENG 3E07
INTRODUCTION TO CULTURAL STUDIES

Module 1
Background

Difference between Culture and Civilization
The concept of Culture/Theorising Culture
What is Cultural Studies?
Globalisation: Power, Inequality and Culture
Popular Culture
Key Methodologies in Cultuaral Studies

Module 2

Chris Barker	An Introduction to Cultural Studies. In *Cultural Studies: Theory and Practice* (pp. 3-31)
Stuart Hall	Cultural Studies: Two Paradigms Cultural Studies and its Theoretical Legacies
Raymond Williams	Advertising: The Magic System

Module 3

Theodore Adorno and Max Horkheimer	The Culture Industry: Enlightenment as Mass Deception.
Michel Foucault	Space, Power, Knowledge
Richard Dyer	Entertainment as Utopia

Module 4

Ashis Nandy	"Tradition, Transgression and Norms" (pp. 1-8) From *The Tao of Cricket*

Sarah Berry	"Fashion."(pp. 454-470) *A Companion to Cultural Studies* (Ed.) Toby Miller
James Staples	Civilizing Taste: From Caste to Class in South Indian Foodways. *Food Consumption in Global Perspectives* (Eds.) Jakob Klein and Anne Muscott
George Kurman	"What Does Girls' Cheerleading Communicate?" from *Journal of Popular Culture*, Fall 1986

Suggested Reading

Chris Barker	*Cultural Studies: Theory and Practice*
Theodore Adorno	*The Culture Industry*
Raymond Williams	*Culture and Society, 1780-1950*
Mikael Bakhtin	*The Dialogic Imagination* *Rabelais and His World*
Jean Baudrillard	Simulacra and Simulations. In *Jean Baudrillard: Selected Writings*
Roland Barthes	*The Fashion System*
Michael Higgins	*The Cambridge Companion to Modern British Culture*
Christopher Bigsby	*The Cambridge Companion to Modern American Culture*
T. Bennet et al	*New Keywords: A Revised Vocabulary of Culture and Society*
Homi K. Bhabha	*The Location of Culture*
Judith Butler	*Gender Trouble: Feminism and the Subversion of Identity*
Lawrence Grossberg	*Bringing It All Back Home: Essays on Cultural Studies*
David Morley	*Television, Audiences and Cultural Studies*

Journals

International Journal of Cultural Studies
Cultural Studies
Journal of Popular Culture

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Eight out of ten paragraph questions (100 words) from all modules

(8 X 5 = 40 marks)

ENG 3E08
EUROPEAN FICTION

Module 1

Background

Political Affiliation amongst nineteenth and twentieth century European novelists
The response to Indutrialisation, War and Class Relations amongst European novelists
Overview of Twentieth Century Intellectual and Artistic Movements

Module 2

Miguel De Cervantes	*Don Quixote*
Flaubert	*Madam Bovary*
Fyodor Dostoevesky	*Crime and Punishment*

Module 3

Italio Calvino	*If on a Winter's Night a Traveller*
Franz Kafka	*The Trial*
Marcel Proust	*Remembrance of Things Past*

Module 4

Milan Kundera	*The Unbearable Lightness of Being*
Albert Camus	*The Outsider*
Gunter Grass	*The Tin Drum*

Suggested Reading

Norman F. Cantor *Twentieth-Century Culture Modernism to Deconstruction*
Malcolm Bradbury and James McFarlane (Eds.) *Modernism: A Guide to European Literature 1890-1930*
H. Reiss *The Writer's Task from Nietzsche to Brecht*
E. M. Forster *Aspects of the Novel*
A. F. Boyd *Aspects of the Russian Novel*
Michael Bell The Cambridge Companion to European Novelists
A. Burgess *The Novel Now: A Guide to Contemporary Fiction*
E. Starkie *Flaubert: The Making of the Master*
E. Starkie *Flaubert: The Master*
Thorlby *Kafka: A Study*
M.Turnell *The Novel in France*
G. Lukacs *Studies in European Realism*

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Eight out of ten paragraph questions (100 words) from all modules
(8 X 5 = 40 marks)

3E09
INTRODUCTION TO COMPARATIVE LITERATURE

Module 1
Background

Definition and Scope of Comparative Literature
Development of the Discipline
Methodology
Comparative Indian Literature

Module 2
Theory

1. French School:
(a) Literary Schools and Genres
(b) Ideological Echoes (including Theological, Philosophical, Ethical, Political, Scientific and Aesthetic Ideas)
(c) Image Echoes
(d) Verbal Echoes
(e) Human Models and Heroes
2. American School
(a) The Parallelism Theory
(b) The Intertextuality Theory (Literature and other fields of Cognition)

Module 3

The Concept of Influence
(Literary and Non-Literary; Direct and Indirect; Positive and Passive)
The Concept of Reception
The Concept of Imitation and Borrowing

Module 4
Essays

Hutcheson Maculay Posnett The Science of Comparative Literature*
Mary Louise Pratt Comparative Literature and Global Study: A Redefinition of the Discipline.*
René Wellek The Crisis of Comparative Literature (in Concepts of Criticism)
Matt Waggoner A Review of Gayatrhi Chakravorty Spivak, *Death of a Discipline*

Suggested Reading

Susan Bassnett *Comparative Literature: A Critical Introduction*
Charles Bernheimer *Comparative Literature in the Age of Multiculturalism*
Amiya Dev *The Idea of Comparative Literature in India*,
Amiya Dev and Sisir Kumar Das (eds.) *Comparative Literature: Theory and Practice*
Claudio Guillen *The Challenge of Comparative Literature*.
Prawar SS *Comparative Literature Studies*
Stalknett NP et al. Comparative Literature
Spivak, Gayatri Chakravorty Death of a Discipline
Wellek, Rene and Austin Warren *Theory of Literature*
Ulrich Weisstein *Comparative Literature and Literary Theory*.
*Charles Bernheimer (ed.), *Comparative Literature in the Age of Multiculturalism*, Baltimore, the Johns Hopkins Univ. Press, 1995, PP. 58 - 65
**The Contemporary Review* (79), 1901, pp. 855-72.

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
(a) One essay of 350 words out of two from Module 1 (10 marks)
(b) One essay of 350 words out of two from Module 2 (10 marks)
(c) One essay of 350 words out of two from Module 3 (10 marks)
(d) One essay of 350 words out of two from Module 4 (10 marks)

II Eight out of ten paragraph questions (100 words) from all modules
(8 X 5 = 40 marks)

SEMESTER 4—Six Core Courses including Project Work and Viva-voce

Semester	Course Code	Title	Internal	External	Total	Credit	Hours
IV	ENG 4C 12	Postcolonial Writings	20	80	100	4	6
	ENG 4C 13	Women's Writing	20	80	100	4	6
	ENG 4C 14	Film Studies	20	80	100	4	6
	ENG 4C 15	Comprehension	20	80	100	4	4
	ENG PR 16	Project	20	80	100	4	3
	ENG 4C 17	Viva-Voce	00	100	100	4	0
	TOTAL		**100**	**500**	**600**	**24**	**25**

ENG 4C12
POSTCOLONIAL WRITINGS

Module I
General Topics

Major Themes and Concerns in Postcolonial Writing: Diaspora, Assimilation, Appropriation, Hybridity, Alterity.
"Orientalism" or Exoticizing, Subaltern, Race relations.
The Problems and Consequences of Decolonization, Aboriginal Writing.

Module 2
Poetry
Detailed

Al Purdy	Married Man's Song
Oodgeroo Noonucal	All One Race
Derek Walcott	The Sea is History
David Diop	Africa
Leopold Senghor	Black Woman

Non-detailed

John Shaw Neilson	Surely God was a Lover.

Gabriel Okara	Piano and Drums, Were I to Choose.
Yasmine Goonaratne	On An Asian Poet Fallen among American Translators
Faiz Ahmad Faiz	Nowhere, No Trace Can I Discover.

Module 3

Prose /Literary Criticism

Edward Said	Introduction to *Orientalism*. Sections I and II
Henry Louis Gates Jr.	"Writing 'Race' and the Difference it Makes." (From *Feminist Literary Theory: A Reader* .Ed. Mary Eagleton.)
Homi Bhabha	"Of Mimicry and Man: The Ambivalence of Colonial Discourse."(From *The Location of Culture.*London: Routledge, 2006*).*
Oyeronki Oyewumi	" Colonising Bodies and Minds: Gender and Colonialism" (Only the sections "Gender and Colonialism" and "The State of Patriarchy")
Ngugi Wa Thiongo	"The Language of African Literature" Sections III, IV andV.
Frantz Fanon	"Reciprocal Bases of National Culture and the Fight for Freedom" (From the Essay "On National Culture" by Fanon)

Module 4

Fiction

V. S.Naipaul	*A House for Mr. Biswas*
Chimamanda Adichi	*Half of a Yellow Sun*
Jean Rhys	*Wide Sargasso Sea*
Salman Rushdie	*Midnight's Children*

Module 5

Drama

Detailed

Wole Soyinka	*Death and the King's Horseman*

Non-Detailed

Marguerite Duras	*India Song*
Aime Cesaire	*A Tempest*

Suggested Reading

Frantz Fanon *The Wretched of the Earth.*
___________ *Black Skin, White Masks.*
Edward Said *Orientalism*.
__________ *Culture and Imperialism*.
Gayatri Spivak *In Other Worlds: Essays in Cultural Politics.*
Ramachandra Guha. (Ed.) *Subaltern Studies*.
Neil Lazarus *The Cambridge Companion to Postcolonial Literary Studies*
Ashis Nandy *The Intimate Enemy*.
Partha Chatterjee *Nationalist Thought and the Colonial World.*
Aime Cesaire *Discourse on Colonialism.*
AtoQuayson *The Cambridge Companion to the Postcolonial Novel*
R.Young *White Mythologies: Writing, History and the West.*
F. AbiolaIrele *The Cambridge Companion to the African Novel*
Kunapipi Journal of Postcolonial Writing and Culture

Question paper pattern

Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)
- (a) One essay of 350 words out of two from Module 1 (10 marks)
- (b) One essay of 350 words out of two from Module 3 (10 marks)
- (c) One essay of 350 words out of two from Module 4 (10 marks)
- (d) One essay of 350 words out of two from Module 5 (10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 2 and the drama for detailed study in Module 5. (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Module 2 (non-detailed poems), Module 3, Module 4 and Module 5. (4 X 5 = 20 marks)

ENG 4C13
WOMEN'S WRITING

Module I
Background

Theoretical Approaches to Women's Writing
Women's Tradition, Women's Canon
Women's Literary Lineage, Race, Class and Sexuality
Expansion of the Literary Canon—Styles and Strategies of Writing
Women's Writing in India—Gender and Genre
Post-Colonialism and Feminism

Module 2
Fiction/Non Fiction

Margaret Atwood	*The Handmaid's Tale.*
Maya Angelou	*I Know Why the Caged Bird Sings*
Lalithambika Antharjanam	*Agnisakshi*

Module 3
Poetry
Detailed

Akkamaha Devi	You have Come
Janabai	Cast off all Shame
Kamala Das	An Introduction
Judith Wright	The Killer
Anne Sexton	After Auschwitz

Non-detailed

Judith Wright	The Company of Lovers
Denise Levertov	Talking to Grief
Anne Sexton	Briar Rose (Sleeping Beauty.)
Sappho	On What is Best, One Girl

Module 4
Theory

Elaine Showalter	From *A Literature of Their Own :British Novelists from Bronte to Lessing.*
Juliet Mitchell	Femininity, Narrative and Psychoanalysis.
Ann Barr Snitow	Mass Market Romance"
Bell hooks	Postmodern Blackness: 'Yearning, Race, Gender and Cultural Politics,
Jonathan Culler	Reading as a Woman.
Judith Butler	Gender Trouble: Feminism and the Subversion of Identity."

(All essays/sections are from *Feminist Literary Theory: A Reader*. Ed. Mary Eagleton)

Module 5
Drama
Detailed

Caryl Churchill	*Top Girls*

Non-Detailed

Maria Irene Fornes	*Fefu and Her Friends*
Elizabeth Robins	*Votes for Women*!

Suggested Reading

Ed Sue Roe	*Women Reading Women's Writing*
Catherine Belsey	*Critical Practice*
Nancy Armstrong	*Desire and Domestic Fiction: A Political History of the Novel*
Juliet Mitchell	*Women: The Longest Revolution*
Ellen Moers	*Literary Women*
Maren Tova Linett	*The Cambridge Companion to Modernist Women Writers*
Janet Todd	*Feminist Literary History: A Defence*
Ellen Rooney	The Cambridge Companion to Feminist Literary Theory
Toril Moi	*Textual/Sexual Politics: Feminist Literary Theory*
Ed. Toril Moi	*French Feminist Thought: A Reader*
Alice Walker	*In Search of Our Mothers' Gardens*

Signs: Journal of Women in Culture and Society.

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2	(10 marks)
(c) One essay of 350 words out of two from Module 4	(10 marks)
(d) One essay of 350 words out of two from Module 5	(10 marks)

II Four out of six annotation questions (80 words) from the poems prescribed for detailed study in Module 3 and the detailed drama in Module 5 (4 X 5 = 20 marks)

III Four out of six paragraph questions (100 words) from Modules 2 (non-detailed poems), 3, 4 and 5. (4 X 5 = 20 marks)

ENG 4C14
FILM STUDIES

Module 1
Background

Literature and Film
Film Criticism: Different Approaches
Italian Neo-Realism and the French New Wave
Asian Cinema (Japanese, Korean, Iranian and Indian)
Contemporary Malayalam Cinema

Module 2

Film Terms: Auteur Theory, Camera Angle, Cinema Verite, Cutting (cross, final, jump), Editing (continuity, dissolve, fade, invisible), Time (experienced, running, diegetic, simultaneous, subjective), Filmic Time and Space, Focus (deep-focus, deep-field,) Shots (close-up, establishing, medium, long, master, pan, tracking, insert), Mise-en-scene, Montage, Scene, Script, Special Effects.

Film Genres: Animation, Biopic, Crime Thriller, Documentary, Fantasy, Horror, Gangster, Historical, Road Movies, Science Fiction, War, Sports, Western, Indian Cinema (Masala movies, Parallel, South Indian Films)

Module 3
Film Theory

Andre Bazin	The Evolution of the Language of Cinema
Laura Mulvey	Visual Pleasure and Narrative Cinema
Christian Metz	Some Points in the Semiotics of Cinema
Mary Ann Doane	Film and the Masquerade: Theorizing the Female Spectator
Michael Allen	The Impact of Digital Technologies on Film Aesthetics

Module 4
Films to be screened and analysed

(One Essay Question on one of these films)

1. Sergei Eisentstein	Battleship Potemkin
2. Alfred Hitchcock	Psycho
3. Yasujiro Ozu	Floating Weeds
4. Stanley Kubrick	2001: A Space Odyssey
5. David Lean	The Bridge on the River Kwai
6. Satyajit Ray	Pather Panchali

Suggested Reading

Andrew Dix *Beginning Film Studies*
Susan Hayward *Key Concepts in Cinema Studies*
Jarek Kupsc *The History of Cinema\: For Beginners*
Tim Bywater and Thomas Sobchack (Eds.) *Introduction to Film Criticism*
Leo Braudy & Marshall Cohen (Eds.) *Film Theory and Criticism: Introductory Readings*
Dudley Andrew *Concepts in Film Theory*
Dudley Andrew *The Major Film Theories: An Introduction*
Robert Stam and Toby Miller (Eds.) *Film and Theory: An Anthology*

Jay Leyda (Ed. and Translated) *Sergei Eisenstein: Film Form (Essays in Film Theory)*
Ed. Manju Jain *Narratives of Indian Cinema*
Mainspring Publishers *Introducing Film Studies*

Question paper pattern
Duration: 3 Hrs **Maximum Marks: 80**

I Essay (40 marks)

(a) One essay of 350 words out of two from Module 1	(10 marks)
(b) One essay of 350 words out of two from Module 2 (From Film Genres only)	(10 marks)
(c) One essay of 350 words out of two from Module 3	(10 marks)
(d) One essay of 350 words out of two from Module 4	(10 marks)

II Eight out of ten paragraph questions (100 words) from all modules
(8 X 5 = 40 marks)

ENG 4C15
COMPREHENSION

The Comprehension course comprises only the texts prescribed for the core courses in the PG programme. The question paper will consist of 40 (forty) multiple choice objective type questions and 40 (forty) fill in the blanks questions requiring one word or phrase each as answers.

The questions will test the overall understanding of the topics and the texts prescribed. This course is intended to equip the students to face the UGC-NET and similar examinations. The course will carry 20 internal marks based only on oral test of similar questions.

ENG PR 16
PROJECT

The students are expected to prepare, under the guidance of a supervising teacher, a dissertation based on an intensive study on any author or a topic of their choice. Dissertation exclusively on texts prescribed for study as part of the M.A. course is to be avoided.

Guidelines:

No. of Copies	:	One typed and hard-bound copy to be submitted to the university
Length	:	12000-14000 words (50-60 pages back to back)
Font	:	Times New Roman/Calibri, 12 point. Headings 14 points.
Line Spacing	:	Double space between lines, No additional space between paragraphs
Alignment	:	Left aligned; Headings centralized.

Margins : 1.6” on left, 1.1 on all other sides.
Citation and Bibliography : As per MLA Style sheet (8th edn.)
Deadline for Submission : Within 14 days after the date of the last external examination of fourth semester
Internal assessment : By the supervising teacher (Max marks: 20)
External valuation : At the valuation camp (Max. Marks: 80).

In the Comprehensive Viva in Semester 4, questions are to be asked from the project too.
Criteria for Evaluation (both internal and external) : Clarity of thought and expression, Logicality of arguments, Relevance and novelty of the topic, grip over the theoretical/analytical tools, conformity to methodology.

ENG 4C 17
VIVA VOCE

The viva-voce will be based on all courses including the electives and the project. Questions testing extensive and intensive understanding of the topics and the texts prescribed will be asked. The viva voce board will consist of two external examiners appointed by the university. The viva of one candidate will have the duration of minimum 20 minutes. The course does not carry any internal marks.

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KANNUR UNIVERSITY

(Abstract)

(MCJ) Master of Communication and Journalism Programme - under Credit Based Semester System in Affiliated Colleges - Revised Scheme, Syllabus &Model Question Papers- Implemented with effect from 2016 Admission - Orders issued.

ACADEMIC C SECTION

U.O No. Acad/C1/10822/2014 Civil Station (PO), Dated, 11-07-2016

Read:
1. U.O.No.Acad C1/11460/2013 dtd 12-03-2014
2. U.O.of even No dtd 29-08-2014
3. U.O.No.Acad C1/11460/2013 dated 05-12-2015 & 22-02-2016
4. Minutes of the meeting of the Board of Studies in Journalism & Mass Communication(Cd) held on 25-02-2016
5. U.O. of even No dtd 31-03-2016
6. Letter dated 27- 06- 2016 from the Chairman, Board of Studies in Journalism & Mass Communication(Cd)

ORDER

1. The Regulations for Credit Based Semester System for P.G. Programmes in affiliated Colleges were implemented in the University with effect from 2014 admission vide paper read (1) above and certain modifications were effected to the same vide paper read (3) above.

2. As per the paper read (2) above, the Scheme,Syllabus & Model Question papers for Master of Communication and Journalism (MCJ) Programme were implemented in the University under Credit Based Semester System .w.e.f. 2014 admission.

3. As certain anomalies were reported in the existing MCJ Syllabus implemented w.e.f 2014 admission and since the question paper setting of 2014 admission 3rd Sem and 2015 admission Ist Semester was over, the BOS vide paper read (4) above, decided to follow the existing Syllabus for 2014 & 2015 admission and the above decision of the board was implemented vide paper read (5) above. The Board of Studies also decided to revise the Syllabus w.e.f 2016 admission in the light of decision of the meeting and approved the restructured Syllabus by correcting the anomalies to be implemented w.e.f.2016 admission.

4. The Chairman Board of Studies in Journalism & Mass Communication (Cd) vide paper read (6) above has forwarded the revised Scheme, Syllabus and Model Question paper for Master of Communication and Journalism (MCJ) Programme for implementation with effect from 2016 admission.

5. The Vice Chancellor after considering the matter in detail, and in exercise of the powers of the Academic Council conferred under section 11 (1) of Kannur University Act 1996 and all other enabling provisions read together with has accorded sanction to implement the revised Scheme ,Syllabus and Model Question papers as recommended by the Board of Studies in Journalism and Mass Communication (Cd) under Credit Based Semester System in affiliated Colleges with effect from 2016 admission, subject to report to the Academic Council.

6.Orders are, therefore, issued accordingly.

7. The revised Scheme, Syllabus and Model Question Papers w.e.f 2016 admission are appended.

Sd/-
JOINT REGISTRAR (ACADEMIC)
For REGISTRAR

\ To

The Principals of Colleges offering MCJ Programmes

Copy to:
1. The Examination Branch (through PA to CE).
2. The Chairman BOS in Mass Communication & Journalism (Cd)
3. SF/DF/FC.

Forwarded /By Order

SECTION OFFICER

For more details; log on www.kannur university .ac.in

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KANNUR UNIVERSITY

REVISED SCHEME AND SYLLABUS FOR

PG PROGRAMME IN

Master of Communication and Journalism (MCJ)

UNDER CREDIT BASED SEMESTER SYSTEM

KU CBSS-PG-2014

FOR

AFFILIATED COLLEGES UNDER KANNUR UNIVERSITY

From 2016 ADMISSION onwards

Prepared and offered by: *Board of Studies of Journalism and Mass Communication, Kannur University*

MCJ Programme SYLLABUS for Affiliated Colleges in Kannur University w.e.f 2016

Master of Communication and Journalism

The syllabi of MCJ programme offered in the affiliated colleges of the university under semester system have been revised in the light of the decision of the meeting of the Board of studies, Journalism and Mass Communication held on 25/02/2016. The revised syllabi shall apply to MCJ programmes conducted by the affiliated colleges of Kannur university with effect from the academic year 2016-17 (2016 admission onwards) and regulations of PG Programme of Kannur University (KUCBSS –PG-2014) - U.O. No: Acad/C1/11460/2013 Dated 12/03/2014 and the revised order No.Acad/C1/11460/2013 Dated 05/12/2015 and 22.02.2016 shall be applicable to the MCJ Programme implemented w.e.f. 2016 admission.

I. Programme structure:

I Semester -from June to October

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 1C 01	Introduction to Mass Communication	06	04	15	60	75
2	Core	MCJ 1C 02	Reporting for Newspapers	06	04	15	60	75
3	Core	MCJ 1C 03	Editing for Newspapers	06	04	15	60	75
4	Core	MCJ 1C 04	Television Production	07	04	15	60	75
Total				25	16	60	240	300

II Semester -from November to March

No	**Core / Elective**	**Course Code**	**Title of the Course**	**Hours allotted per week**	**Credits**	**Marks**		
						CA	ESE	Total
1	Core	MCJ 2C 05	Media Laws and Ethics	04	04	15	60	75
2	Core	MCJ 2C 06	Magazine Journalism	04	04	15	60	75
3	Core	M CJ 2C 07	Communication Theories	04	04	15	60	75
4	Core	MCJ 2C 08	Radio Production	04	04	15	60	75
5	Elective**	MCJ 2E 01	Photo Journalism	04	04	15	60	75
6	Elective**	MCJ 2E 02	Travel Journalism					
7	Elective**	MCJ 2E 03	Health Communication					
8	Practical – I	MCJ 2 P 01	Newspaper production , Video production, Magazine production and Radio production	05	02	10 (2.5+2.5+2.5+2.5)	40 (10+10+10+10)	50
Total				25	22	85	340	425

**** Select one elective from this group**

III Semester -from June to October

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 3C 09	Public Relations and Corporate Communication	05	04	15	60	75
2	Core	MCJ 3C 10	Advertising	05	04	15	60	75
3	Core	MCJ 3C 11	Mass communication Research	05	04	15	60	75
4	Core	MCJ 3C 12	Television Journalism	05	04	15	60	75
5	Elective**	MCJ 3E 04	Indian Politics and Communication	05	04	15	60	75
6	Elective**	MCJ 3E 05	Agricultural Journalism					
7	Elective**	MCJ 3E 06	Business Journalism					
8	Elective**	MCJ 3E 07	Development Communication					
Total				25	20	75	300	375

**** Select one elective from this group**

IV Semester- from November to March

No	Core / Elective	Course Code	Title of the Course	Hours allotted per week	Credits	Marks		
						CA	ESE	Total
1	Core	MCJ 4C 13	Introduction to Cinema	05	04	15	60	75
2	Core	MCJ 4C 14	New Media and Online Journalism	05	04	15	60	75
3	Elective**	MCJ 4E 08	Technical Writing	05	04	15	60	75
4	Elective**	MCJ 4E 09	Fashion Communication					
5	Elective**	MCJ 4E 10	Sports Journalism					
6	Practical – **II**	MCJ 4P 02	PSA production, TV News bulletin production and Short film production	05	02	10 (2.5+2.5+5)	40 (10+10+20)	50
7	Project	MCJ 4Pr	Dissertation	05 -	03	10	40	50
			Internship*		02	25	-	25
8	Viva Voce	MCJ 4 C 15	Viva Voce	--	03		50	50
Total				25	22	90	310	400

**** Select one elective from this group**

***Marks for internship should be allotted by the HOD**

a. Total marks for semester – I -300
b. Total marks for semester – II- 425
c. Total marks for semester – III- 375
d. Total marks for semester – IV- 400
e. Total marks for semester I to IV- 1500

II. Practicals

Practical –I

MCJ 2 P 01 Newspaper production, Video production, Magazine production and Radio production.

1. Lab Newspapers: 5 Marks

Each student shall submit five single-page printed A3-size lab-newspapers either in Malayalam or in English, prepared as part of reporting assignments within the semester, to be evaluated by external examiners.

2. Newspaper Front Page: 5 Marks

Each student shall edit and design the front page of an A3-size newspaper either in Malayalam or in English, with the stories given by the external examiners.

3. Video production: 10 Marks

Students, divided into teams of four members each, shall produce a video of their choice without dialogue limited to five minutes, during the semester and submit it for external valuation.

4. Magazine production: 10 Marks

Students shall be divided into teams of five members each, to bring out a printed multi-color 32-page-magazine either in Malayalam or in English, reported, subbed and designed by them during the semester. It shall be submitted for external valuation.

5. Radio production: 10 Marks

Each student shall produce a seven minutes radio feature / documentary on a topic and submit it for external valuation.

Practical –II

MCJ 4P 02 PSA production, TV News bulletin production and Short film production

1. PSA production: 10 Marks

Each student shall produce a Public Service Advertisement (PSA) in print/ audio/ visual format and submit it for external valuation.

2. TV News bulletin production: 10 Marks

Students either in groups of 4-5 or individually shall report, edit and present a news bulletin either in Malayalam or in English and submit it for external valuation. The duration of a solo news bulletin shall be seven minutes while for group productions it will be 25 minutes.

3. Short film production: 20 Marks

Students divided into teams of four or five members each shall produce either a documentary or a short film of 15-minutes, in Malayalam or English, within the semester and submit it for external valuation.

III. Dissertation:

In the fourth semester each student shall submit a dissertation on any topic of his/her interest. The dissertation aims at introducing the students with research methodology and to prepare them for doing further research .Students are required to do a dissertation on a topic relating to an area of study chosen in consultation with the faculty. Each student shall be guided in his/her project by a member of the faculty.

IV. VIVA:

A Viva Voce examination will be conducted at the end of IV semester covering the whole programme including the project.

First Semester

MCJ 1C 01 : Intoduction to Mass Communication

Module I

Definition and elements of communication; intra, interpersonal, group and mass communication; verbal and non-verbal communication

Module II

Concept of mass communication; functions of mass communication; strengths and limitations of print, radio, television, film, new media and folk media

Module III

Communication models - Aristotle, Lasswell, Shannon and Weaver, Schramm, Berlo, Andersch-Staats- and Bostorn model, Dance model and Barnlund model

Module IV

Models of mass communication process – transmission, expression, publicity and reception, Westley and MacLean, Riley and Riley and Maletzke

Module V

Flow theories- gatekeeper, gatekeeping models of White, Galtung and Ruge; news flow model - McNelly, Bass and Mowlana; uses and gratifications theory

Module VI

Normative theories of media performance – authoritarian theory, libertarian theory, social responsibility theory, communist theory, development media theory and democratic-participant media theory

Books for Reference

1. Joseph A Devito : Communicology: Introduction to the study of Communication
2. Joseph R. Dominick : The Dynamics of Mass Communication
3. Denis McQuail : McQuail’s Mass Communication Theory
4. Melvin L. Defleur : Fundamentals of Human Communication
5. Denis McQuail and Sven Windhal : Communication Models
6. Aglee, Ault & Emury : Main Currents in Mass Communication
7. J. V. Vilanilam : Mass Communication
8. Melvin L Deflur& Sandra Ball-Rokaech : Mass Communication Theory
9. Vir Bala Aggarwal, V. S. Gupta : Handbook of Journalism and Mass Communication

Books for Further Reading

Marshall McLuhan : Understanding Media

David K Berlow : The Process of Communication

Kuppuswami : Communication and Social Change

Keval J Kumar : Mass Communication in India

D S Mehta : Mass Communication and Journalism in India

Dr. J V Vilanilam : Mass Communication in India

I. Continuous Assessment -Total marks 15

1. Class Test: (6 marks)

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module six.

2. Attendance: (4 marks)

Allotment of marks as per University regulations.

3. Seminar: (2.5 marks)

Power point presentation by each student on current trends, challenges and issues in the field of communication.

4. Assignments: (2.5 marks)

II. End Semester Examination: 60 Marks

Model Question Paper

MCJ Degree Examination

MCJ 1C 01:Introduction to Mass Communication

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I. Write short notes on any FOUR of the following:

1. Information society
2. Demassification
3. Global village
4. Information Society
5. Feedback
6. Gatekeeper

II. Compare and contrast the characteristics of print media with electronic media.

III. Describe the process of communication with the help of Berlo's model.

IV. Bring out the differences between the libertarian theory and social responsibility theory.

V. Explain the functions and dysfunctions of mass communication.

VI. Critically examine the uses and gratifications theory.

VII. Define communication and explain the types of communication.

VIII. Discuss the models of communication process.

MCJ: First Semester

MCJ 1C 02: Reporting for Newspapers

Module I

A brief history of newspaper journalism in India - early English and Malayalam newspapers and editors; English and Malayalam newspaper journalism today; Journalism as mission and profession **-** Journalist as reporter, interpreter, investigator, reformer, watchdog and activist; qualities and responsibilities of a reporter; reporting terminology

Module II

Definition and ingredients of news; types of news - hard and soft news, human interest stories, straight news, interpretative stories, brights, follow-ups, roundups and sidebars ; News structure - inverted pyramid, narrative, hourglass and focus; variety in leads; new journalism; precision journalism

Module III

News sources – news agencies, news releases, news conferences, news briefs, meet-the-press, beats and other media; tapping news sources; source credibility and attribution; off-the-record; Computer Assisted Reporting (CAR)

Module IV

Interviewing - news and personality interviews, telephonic and online interviews - interviewing hazards and tactics, research, angle, questions and presentation formats

Module V

Reporting accidents, natural calamities, natural and unnatural deaths, communal and political violence, terrorism, crime, sports, politics, elections, education, speech, seminar, environment, science, and technology, agriculture, budget, business and entertainment

Module VI

Investigative reporting – major scoops, undercover journalism, sting operation, public interest versus invasion of privacy, yellow journalism and Press Council of India's guidelines; citizen journalism

Module VII

News filters - adversarial journalism, advocacy journalism, advertorials, chequebook journalism, embedded journalism, gonzo journalism, lapdog journalism, mojo and sojo, market-driven journalism, Mc Journalism, media scrum, newszak and tabloidization; ombudsman

Books for Reference

1. Melvin Mencher, **News Reporting and Writing**, New York, Oxford University Press, 2007
2. Jerry Lanson and Mitchell Stephens, **Writing and Reporting the News**, New York: Oxford University Press, 2008.
3. Fred Fedler and John Bender, **Reporting for the Media**, New York: Oxford University Press, 2001
4. Ambrish Saxena, **Fundamentals of Reporting and Editing**, New Delhi: Kanishka Publishers, 2007
5. Bob Franklin and Martin Hamer, **Key Concepts in Journalism Studies**, New Delhi: Vistaar Publications, 2006.
6. Tony Harcup, **Journalism: Principles and Practice**, New Delhi: Sage Publications, 2004.
7. Lynette Sheridan Burns, **Understanding Journalism**, New Delhi: Sage Publications, 2002.
8. Joan Clayton, **Interviewing for Journalists**, London: Piatkus Publishers, 1994
9. Hugo de Burgh, **Investigative Journalism**: **Context and Practice**, London: Routledge, 2000.
10. Straubhaar Larose, **Media Now**, New York: Thomson Wadsworth, 2004
11. Vanita Kohli–Khandekar, **The Indian Media Business**, New Delhi: Sage Publications, 2006

Books for Further Reading

1. B.G. Verghese (Ed.), **Breaking the Big Story; Great Moments in Indian Journalism,** New Delhi: Penguin Books, 2003.
2. David Randall, **The Great Reporters**, London: Pluto Press, 2005.
3. T.J.S. George**, Lessons in Journalism: The Story of Pothan Joseph**, New Delhi: Viva Books, 2007
4. Anita Pratap, **Island of Blood**, New Delhi: Penguin Books, 2002
5. B. G. Verghese, **Warrior of the Fourth Estate**: **Ramnath Goenka of the Express**, New Delhi: Penguin Books, 2005

6. Kuldip Nayar, **Scoop: Inside Stories from the Partition to the Present**, New Delhi: HarperCollins Publishers, 2006
7. Edward Herman & Noam Chomsky, **Manufacturing Consent: The Political Economy of the Mass Media,** New York: Vintage, 1994
8. Bob Woodward, **The Secret Man: The Story of Watergate's Deep Throat**, London: Simon & Schuster, 2005.
9. P. Sainath, **Everybody Loves a Good Drought**, New Delhi: Penguin Books, 2004.
10. Laurence Campbell and Roland Wolseley, **How to Report and Write the News**, New York; Prentice-Hall, 1961
11. Shanti Swarrop Singh, **The Press and the Indian Parliament**, New Delhi, Classical Publishing Company, 2001
12. Curtis Macdougall, **Interpretative Reporting**, London; Macmillan Company, 1970
13. Carl Warren, **Modern News Reporting**, New York: Harper & Brothers Publications, 1968

I. **Continuous Assessment: 15 Marks**

1. **Class Tests : 6 Marks**

   There shall be two internal examinations within the semester: One, at the completion of module four and the second, at the completion of module seven.

2. **Attendance : 4 Marks**

   Allotment of marks as per University regulations.

3. **Interview Assignment : 2.5 Marks**

   Each student shall submit a personality interview for assessment

4. **Seminar Presentation : 2.5 Marks**

II. End semester examination: 60 Marks

Model Question Paper

First Semester MCJ Degree Examination

MCJ 1C 02: Reporting for Newspapers

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following.

1. Computer Assisted Reporting
2. Process Journalism
3. Readers' Editor
4. Chequebook Journalism
5. Broadloidization
6. Media Activism

II. Today journalism all at once is a mission, a profession and a business. Substantiate the demands and constraints placed on the journalists in their career in the current scenario.

III. Investigative reporting presupposes persistence, painstaking research and perilous risks. Comment on the challenges involved in scoops and exclusives, with suitable examples.

IV. The lead, the central part of a story can be written creatively with multifarious styles. Present any 12 popular innovative intros used in the newspapers today.

V. A journalist is neither a stenographer nor a historian, but is a reporter, a reformer and an activist. Comment on this statement explaining the prerequisites for a successful journalistic interview.

VI. The heart of newsgathering for a newspaper is the beat and extracting information is an art. Explain the rudiments of beat reporting and cultivation of news sources.

VII. Crime unreported is crime licensed and encouraged. Explain with examples the efficacy and challenges of crime reporting without going to the extremes of sensationalism.

VIII. To a journalist any event is a STORY to be reported. To a historian any event is a FACT to be recorded. Explain the contrast in the writing style of journalists and historians, with appropriate examples.

MCJ: First Semester

MCJ 1C 03: Editing for Newspapers

Module I

Organizational structure of the editorial department - qualities and responsibilities of chief editor, assistant editor, news editor, bureau chief, special correspondents, chief sub-editors and sub-editors; editing terminology

Module II

Newsman's language - active and positive sentences; avoidance of verbosity, redundancies, clichés and monotony; transition devices; precision in vocabulary; subject and verb agreement; tenses in news writing; accuracy in punctuations, prepositions and auxiliaries

Module III

Editing process – checking facts, correcting and polishing language, rewriting leads, condensing stories, localizing news and angling news; editing for accuracy, objectivity, fairness, moral and legal propriety; translating stories from English to Malayalam and from Malayalam to English; editing handouts and news releases; handling wire copy; revising stringers' and citizen journalists' stories; stylebook consistency

Module IV

Headlines –types and functions of headlines; principles of headlining; subheads, captions and catchwords; traditional and modern headline styles;

Module V

Editorial page – editorials, opinion pieces, middles and letters to the editor; principles of editorial writing; types of editorials; qualities of and responsibilities of leader writers;

Module VI

Newspaper layout and design – principles of artistic design – balance, contrast, proportion and unity; traditional and modern design; typography and pagination; photographs, info-graphics; design softwares

Books for Reference

1. Bruce Westley, **News Editing**, Boston: Houghton Mifflin Company, 1972
2. Harold Evans, **Newsman's English, Handling Newspaper Text, News Headlines, Pictures on a Page, Newspaper Design** *(A Five-Volume Manual of English, Typography and Layout)* London: National Council for the Training of Journalists, 1984.
3. Floyd Baskette and Jack Sissors, **The Art of Editing**, New York: Macmillan Publishing Co, 1986
4. Jerry Lanson and Mitchell Stephens, **Writing and Reporting the News**, New York: Oxford University Press, 2008
5. Sunil Saxena, **Headline Writing**, New Delhi: Sage Publications, 2006
6. Ambrish Saxena, **Fundamentals of Reporting and Editing**, New Delhi: Kanishka Publishers, 2007
7. Carl Sessions Stepp, **Writing as Craft and Magic**, New York: Oxford University Press, 2007

Books for Further Reading

1. T.J.S. George, **Editing: A handbook for Journalists**, New Delhi: Indian Institute of Mass Communication, 1989
2. M.L. Stein and Susan Paterno, **The News Writer's Handbook**, New Delhi: Surjeet Publications, 2003
3. George Hough, **News Writing**, New Delhi: Kanishka Publishers, 2004
4. Jan Hakemulder and Fay Jonge, **News Reporting and Editing**, New Delhi: Anmol Publications, 2002
5. Ron Smith and Loraine O'Connell, **Editing Today**, New Delhi: Surjeet Publications, 2004

6. M.K. Joseph, **Outline of Editing**, New Delhi: Anmol Publications, 2002

I. Continuous Assessment: 15 Marks

1. **Class Tests : 6 Marks**

   There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

2. **Attendance : 4 Marks**

   Allotment of marks as per University regulations.

3. **Assignment: 2.5 Marks**

   Each student shall submit an editorial on a subject selected by the faculty for assessment

4. **Seminar Presentation: 2.5 Marks**

II. End Semester Examination: 60 Marks

Model Question Paper

First Semester MCJ Degree Examination

MCJ 1C 03: Editing for Newspapers

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks**.**

I. Write short notes on any four of the following:

1. Stylebook
2. Verbosity
3. Middles
4. Objectivity
5. Moral Propriety
6. Space Saving Techniques

II. The headline is the reader's guide, compass and index. Explain the functions of a headline in terms of readers' utility with appropriate examples.

III. Newspapering is a teamwork that needs symphony and synchronization. Present the organizational structure of a newspaper, explaining the responsibilities of the key persons in the editorial department.

IV. The sub-editor is the unsung hero in a newspaper. Comment on this statement on the challenges and responsibilities entailed in subbing.

V. The editorial reflects the stand of the newspaper on a given issue and therefore, it demands an in-depth research and analysis. Explain with examples the keys to punchy editorials.

VI. Headline the Following Stories (4x 3=12 marks)

1. CHANDIGARH: CPI (M) general secretary Prakash Karat on Wednesday ruled out any scope of alliance with the Congress in any State during the run-up to the Lok Sabha elections, as the party was committed to ensure the defeat of the Congress as well as the BJP.

Talking to reporters on the sidelines of a meeting of the party's Punjab State Council here, Mr. Karat reiterated that the CPI(M) would be part of a non-Congress secular alliance of like-minded parties. If voted to power, the alliance would not only scrap the India-U.S. nuclear deal but also reverse a plethora of anti-people policies implemented during recent years.

2. THIRUVANANTHAPURAM: The Kerala Regional Committee of the Indian Newspaper Society (INS) has urged the Chief Minister V.S. Achuthanandan to make arrangements to revise government advertisement rates in view of the crisis faced by the newspaper industry owing to shortage of newsprint caused by the global meltdown.

INS also urged Electricity Minister T.K. Balan to exempt the newspaper industry from the 25 per cent curb on power supply and higher tariff rates, including thermal surcharge. In its memorandum to the Chief Minister, INS pointed out that the prices of newsprint had witnessed a 50 per cent increase in the last few months, with prices ruling at $ 900 (Rs. 40,500) a metric tonne, excluding transportation costs, up from $ 600 (Rs. 27,000).

3. HYDERABAD: Railways retained the title in the All-India inter-state senior women's cricket championship with an emphatic 10-wicket win over Maharashtra in the final at the Rajiv Gandhi Stadium here on Wednesday. Maharashtra elected to bat on a perfect batting strip but failed to make use of the opportunity and finished with a modest score of 153 for nine in 50 overs.

4. DUBAI: The Organisation of Petroleum Exporting Countries (OPEC) will cut daily oil production by 2 million barrels to shore up falling energy prices.

Saudi Arabia’s Oil Minister Ali Naimi said on Wednesday, ahead of a crucial meeting of the grouping in Algeria, that there was a consensus among members to cut production by 2 million barrels from January 1, 2009.

VII. Edit and Headline Barack Obama's Speech

If there is anyone out there who still doubts that America is a place where all things are possible, who still wonders if the dream of our founders is alive in our time, who still questions the power of our democracy, tonight is your answer. It's the answer spoken by young and old, rich and poor, Democrat and Republican, black, white, Hispanic, Asian, Native American, gay, straight, disabled and not disabled. We are, and always will be, the United States of America.

I will never forget, who this victory truly belongs to. It belongs to you. I was never the likeliest candidate for this office. This is your victory. And I know you didn't do this just to win an election. And I know you didn't do it for me. You did it because you understand the enormity of the task that lies ahead. For even as we celebrate tonight, we know the challenges that tomorrow will bring are the greatest of our lifetime _ two wars, a planet in peril, the worst financial crisis in a century. Even as we stand here tonight, we know there are brave Americans waking up in the deserts of Iraq and the mountains of Afghanistan to risk their lives for us.

There's new energy to harness, new jobs to be created, new schools to build, and threats to meet, alliances to repair. The road ahead will be long. Our climb will be steep. We may not get there in one year or even in one term. But, America, I have never been more hopeful than I am tonight that we will get there. I promise you, we as a people will get there. There will be setbacks and false starts. There are many who won't agree with every decision or policy I make as president. And we know the government can't solve every problem.

But I will always be honest with you about the challenges we face. I will listen to you, especially when we disagree. And, above all, I will ask you to join in the work of remaking this nation, the only way it's been done in America for 221 years _ block by block, brick by brick, calloused hand by calloused hand.

In this country, we rise or fall as one nation, as one people. Let's resist the temptation to fall back on the same partisanship and pettiness and immaturity that has poisoned our politics for so long. Let's remember that it was a man from this state who first carried the banner of the Republican Party to the White House, a party founded on the values of self-reliance and individual liberty and national unity. And tonight, I think about all that she's seen throughout her century in America _ the heartache and the hope; the struggle and the progress; the times we were told that we can't, and the people who pressed on with that American creed: Yes we can.

At a time when women's voices were silenced and their hopes dismissed, she lived to see them stand up and speak out and reach for the ballot. Yes we can. When there was despair in the dust bowl and depression across the land, she saw a nation conquer fear itself with a New Deal, new jobs, a new sense of common purpose. Yes we can. When the bombs fell on our harbor and tyranny threatened the world, she was there to witness a generation rise to greatness and a democracy was saved. Yes we can.

America, we have come so far. We have seen so much. But there is so much more to do. So tonight, let us ask ourselves _ if our children should live to see the next century; if my daughters should be so lucky to live as long as Ann Nixon Cooper, what change will they see? What progress will we have made? This is our chance to answer that call. This is our moment. This is our time, to put our people back to work and open doors of opportunity for our kids; to restore prosperity and promote the cause of peace; to reclaim the American dream and reaffirm that fundamental truth, that, out of many, we are one; that while we breathe, we hope. And where we are met with cynicism and doubts and those who tell us that we can't, we will respond with that timeless creed that sums up the spirit of a people: Yes, we can. Thank you. God bless you. And may God bless the United States of America.

(This speech carries 760 words. Edit it to a 260-word story)

MCJ: First Semester

MCJ 1C 04: TELEVISION PRODUCTION

Module I

Evolution and growth of television till date – *Doordarshan*, SITE, terrestrial, cable, satellite and DTH broadcast; history of Malayalam television

Module II

Audio-visual language - framing ; Types of shots-based on size, camera movements and camera angle; composition, lighting and sound

Module III

Editing - linear and non-linear, continuity editing – insert shot- cut-in and cutaways-acceleration editing, relational editing-Montage, thematic editing and parallel cutting; transition techniques – cut, fade, dissolve, wipe and split screen; visual effects – superimposition and chroma key

Module IV

Television programme formats – serials, chat shows, reality shows, music , games, quizzes, review s- film, documentary, books, music, programmes, promos.

Module V

Studio personals – qualities and responsibilities of producer, floor manager, scene designer, costumer and makeup artist.

Module VI

Stages of production - pre-production, production and postproduction: documentary, fiction; studio productions; field productions.

Module VII

Scripting and production of commercials, PSA and music albums

Books For Reference

1. Stanley J. Baran, ***Introduction to Mass Communication***, McGraw Hill, 2006.
2. Vanita Kohli-Khandekar, **The Indian Media Business**, Response Books, 2006.
3. Zettl, **Television Production Handbook**, Wadsworth, 2000.
4. Ken Dancyger, **The Technique of Film and Video Editing, History, Theory, and Practice,** Focal Press, 2007.
5. Robert L. Hilliard, **Writing for Television, Radio, and New Media**, Wadsworth, 2004.
6. Arthur Asa Berger, **Scripts: Writing for Radio and Television,** Sage Publications, 1990

Books for Further Reading

1. Ralph Donald and Thomas Spann, **Fundamentals of Television Production,** Surjeet Publications, 2004.
2. Anthony Friedmann, **Writing for Visual Media**, Elsevier, 2006.
3. Ivan Cury, **Directing and Producing for Television**, Focal Press, 2007.
4. Joe Nicholas, John Price and Ben Moore, **Advanced Media: Communication and Production,** Nelson, 1996.
5. Bhaskar Ghose, **Doordarshan Days,** Penguin, 2005.
6. G.C. Awsathy, **Broadcasting in India**
7. K.S. Mullick, **Tangled Tapes: The Inside Story of Indian Broadcasting**

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module seven.

2. Attendance : 4 Marks

Allotment of marks as per University regulations.

3. Shooting and Editing Assignment : 5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper

MCJ Degree Examination

MCJ 1C 04: TELEVISION PRODUCTION

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following:

1. Satellite Television
2. Continuity editing
3. Chroma Key
4. Switcher
5. PSA
6. Floor Plan

II. Write a script for a PSA on child labour.

III. Differentiate between linear and non-linear editing with suitable examples of their functioning.

IV. Enumerate the importance of lighting in television production and explain three-point lighting.

V. Detail the hand-signals used by the floor manager in a television production.

VI. What are the major differences between single camera and multi-camera productions? Corroborate with suitable examples.

VII. Trace the history of television in India.

VIII. Comment on the new trends in television programmes.

MCJ: Second Semester

MCJ 2C 05: Media Laws and Ethics

Module I

Concept of ethics - virtue ethics; potter box approach

Module II

Fundamental rights and freedom of speech and expression in Indian Constitution; reasonable restrictions; Emergency and censorship; self-regulation versus censorship; code of ethics for print and electronic media

Module III

Defamation - libel and slander and fair comment; privacy and public interest; contempt of court; contempt of parliament and breach of privilege; media and expunged proceedings of parliament; relevance of Right to Information Act in journalism

Module IV

Reporters and sources – trust and confidentiality; bribes, junkets and freebies; lobbying; puffery and suppression; yellow journalism and page-3 journalism; Paid news sting operation; paparazzi journalism; fakery; video piracy; plagiarism; social responsibility and accountability

Module V

Official Secrets Act; Copyright Act; Young Persons' (Harmful Publications) Act; Indecent Representation of Women (Prohibition) Act; Drug and Magic Remedies (Objectionable Advertisements) Act; Cinematograph Act; Information Technology Act; laws protecting intellectual property rights

Module VI

Working Journalists and other Newspaper Employees (Conditions of Services and Miscellaneous Provisions) Act; Working Journalists (Fixation of rates and Wages) Act; Wage Boards

Module VII

Provisions to restrict media under IPC, Indian Post Office Act, Customs Act, Representation of the People Act, Civil Defense Act, Protection of Civil Rights Act, Criminal Law Amendment Act and Code of Criminal Procedure

Books for Reference

1. Karean Sanders, **Ethics & Journalism**, Sage Publications.
2. Naresh Rao & Suparna Naresh, **Media Laws, an appraisal,** Premier Publishing Company, Bangalore.
3. Kundra S, **Media Laws & Indian Constitution**, Anmol Publications, New Delhi
4. Vakul Sharma, **Handbook of Cyber Laws,** Macmillan
5. Nirmala Lakshman, **Writing a Nation: An Anthology of Indian Journalism**
6. Nalinin Rajan, **Practising Journalism,** Sage Publications
7. Hamid Monlana, **International Information Flow**
8. Shanti Saroop Singh, **The Press and the Indian Parliament,** Classical Publishing Company, New Delhi.

For Further Reading

1. Aravind Singhal & Everett M.Rogers, **India's Communication Revolution,** Sage Publications
2. Edward S. Hrman & Noam Chomsky, **Manufacturing Consent,** Vintage
3. Dr. Jan R. Hakemuldr, **Principles & Ethics of Journalism,** Anmol Publications.
4. Patrick Lee Plaisance, **Media Ethics,** Sage Publications

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

2. Attendance : 4 Marks

Allotment of marks as per University regulations.

3. Seminar : 2.5 Marks

4. Assignments : 2.5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper
MCJ: Second Semester
MCJ 2C 05: Media Laws and Ethics

Time: 3 hours **Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following:

- a) Potter box
- b) Puffery
- c) Plagiarism
- d) Freebies
- e) Human sentiment
- f) Categorical Imperative

II. What are the implications of the Official Secrets Act for a journalist?

III. What are the precautions to be taken while reporting linked with the defamation laws?

IV. Propose a comprehensive code of ethics for the media personnel.

V. How relevant is RTI in journalism? Explain with examples

VI. How can a journalist strike a balance between public interest and invasion of privacy?

VII. “Journalism was originally a mission. Gradually it became a profession. Today it is a business.” Comment

VIII. “24-hour news channels have trivialized and sensationalized news.” Substantiate.

MCJ: Second Semester

MCJ 2C 06: Magazine Journalism

Module I

Origin and growth of magazines; pioneers of magazine journalism - John Dunton, Addison, Steele, Edward Cave; organizational structure of a magazine; A survey of English and Malayalam magazines

Module II

Types of magazines – specialized magazines - general interest and specialized magazines, public relations magazines – internal and external house organs, academic journals and Sunday magazines, e-zines, web-zines and web-edition magazines; Coffee table magazine; magazine journalism terminology

Module III

Qualities and responsibilities of a magazine editor; ingredients of a magazine article; editorial mix; cover story selection criteria, cover design and cover lines, and comparison of cover stories in the mainstream magazines

Module IV

Film reviewing, advertising, criticism and rhetoric; essential elements of a film review – condensed plot synopsis, background information, abbreviated arguments about the film and evaluation; book reviewing – pre-reading, reading and post-reading procedures, writing format and principles of book reviewing, art of reviewing: food, fashion, cosmetics and costumes

Module V

Feature versus news story, feature versus article, feature structure, feature headlines, feature leads, classification of features and steps in writing feature

Module VI

Profile versus biography and profile requisites; writing columns; preparing photo features; writing for specialized magazines; current trends and challenges in magazine journalism-narrative journalism

Module VII

Magazine design and layout, photographs, illustrations, info-graphics, typography and white space; magazine design softwares

Books for Reference

1. John Morrish, **Magazine Editing**, Routledge, 1996
2. Linda McLoughlin, **The Language of Magazines**, Routledge, 2001
3. Michelle Ruberg, **Handbook of Magazine Article Writing**, Writer's Digest, 2005
4. Antony Davis & Heinemann, **Magazine Journalism Today,** Professional Publishing, 1988
5. East R. Hutchison, **The Art of Feature Writing,** Oxford University Press, 2008
6. David E. Sumner & Holly G. Miller, **Feature and Magazine Writing**, Surjeeth Publications, 2006
7. Benton Rain Patterson & Coleman E. P. Patterson, **The Editor in Chief**, Surjeeth Publications, 2005
8. Jenny Mckay, **The Magazine Handbook**, Routledge, 2000

Books for Further Reading

1. Humed Contractor, **The Art of Feature Writing** , Icon Publications, 2004
2. Steephan G. Bloom**, Inside the Writer's Mind,** Surjeeth Publications, 2004
3. Jill Dick,**Writing for Magazines**, Unistar Books, 2004
4. Edward Jay & John Lee, **Feature Writing for Newspapers and Magazines**, Harper and Row Publishers, 1988
5. Paul Nelson, **Articles and Features** , Houghton Mifflin Company, 1978
6. Louis Alexander, **Beyond the Facts**, Surjeeth Publications, 2003
7. Theodore Peterson, **Magazines in the Twentieth Century**, University of Illinois, 1956

I. Continuous Assessment: 15 Marks

1. Class Tests :6 Marks

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

2. Attendance : 4 Marks

Allotment of marks as per University regulations.

3. Seminar and Assignments : 5 Marks

Each student shall make a critical analysis of a magazine and make a presentation. The paper should be submitted for valuation.

II. End Semester Examination: 60 Marks

Model Question Paper

MCJ Degree Examination

MCJ 2C 06: Magazine Journalism

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I Write short notes on any four of the following.

1. E-zines
2. Freebies
3. TOT
4. Typography
5. White Space
6. Pull-quote

II. "A magazine's success is in its cover, cover lines and cover story." Substantiate.

III. "A feature is an unperishable commodity that no reader can miss." Elucidate the recipe for a feature with suitable examples.

IV. "A magazine editor's role is like that of a conductor in a concert." Elaborate on the Herculean task of manning a magazine.

V. "With the onslaught of television news channels, television is today what newspaper was yesterday, newspaper is today what magazine was yesterday, and magazine is today what tabloid was yesterday." Comment on the current trends and survival tactics in the magazine industry today.

VI. "A film review is basically a critique, arousing curiosity but sustaining suspense." Explain with an appropriate example .

VII. "A profile is a life-sketch but not a chronological biography; it is like a garland intertwined with twists and emotional roller coasters." Explicate with examples.

MCJ: Second Semester

MCJ 2C 07: Communication Theories

Module I

Concept of theory; four approaches to theory – media-culturalist, media-materialist, social-culturalist and social materialist; four kinds of theory – social-scientific, normative, operational and everyday/commonsense theory

Module II

Theory of objectivity; mass society theory; information society theory; cultivation theory; agenda setting theory; spiral of silence theory; theory of cultural imperialism and cultural autonomy

Module III

Four dimensional perspective on media effects – timing of effects- immediate and long term, type of effects – cognitive, attitudinal emotional, physiological and behavioural ; media influence on family; impact of media on children; media literacy

Module IV

Four phases of mass communication effects theories – "almighty media", testing the might of the media, return to 'almighty media" and "social constructivist" media influence

Module V

Contemporary theories of mass communication - individual differences theory, social categories theory, social relationships theory and cultural norms theory

Module VI

Media ownership – chain, cross media, conglomerate and vertical integration; media mega mergers; media and cultural imperialism

Module VII

Theories of learning; persuasive communication variables; cognitive dissonance theory, congruity theory and balance theory; information diffusion theory; gate-keeping theory; two-step flow and multi-step flow theories ; feminist media theory.

Module VIII

Media and political communication theories – pluralist model, dominant-ideology model, elite-values model and market model; media as custodians of democracy; mass media and governance; media and globalization; mass media as propaganda machines; politics of spin

Books for Reference

1. Stanley J. Baran & Dennis K Davis, **Mass Communication Theory**: **Foundations, Ferment, and Future,** Thomson & Wadsworth

2. Gerald Stone, **Clarifying Communication Theory**, Surjeet Publications

3. Denis McQuail, **McQuail's Mass Communication Theory**, Sage Publications

4. Denis McQuail, **McQuail's Reader in Mass Communication Theory**, Sage Publications

5. Bettinghus E P, **Persuasive Communication**

6. Melvin l. DeFleur**, Theories of Mass Communication,** David Mckay Company

7. J.V. Vilanilam, **Mass Communciation: Theory and Practice**, Makhanlal Chaturvedi Rashtriya Patrakarita Viswavidyalaya, Bhopal

8. Srinivas R. Melkote & Sandhya Rao, **Critical Issues in Mass Communication**, Sage Publications

9. W. James Potter, **Media Literacy**, Sage Publications

I. Continuous Assessment: 15 Marks

1. Class Tests :6 Marks

There shall be two internal examinations within the semester: one, at the completion of module five and the second, at the completion of module eight.

2. Attendance : 4 Marks

Allotment of marks as per University regulations.

3. Seminar :2.5 Marks

4. Assignments :2.5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper
MCJ Degree Examination

MCJ 2C 07: Communication Theories

Time: 3 Hours **Max. Marks: 60**

Answer question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following:

1. Culture jamming
2. Convergence
3. Information Society
4. Streaming
5. Spin
6. Digital divide

II. 'Mass media have a uniform and direct effect on the society.' Examine the validity of this theory, with a postmortem of the various media impact studies.

III. Examine the implications inherent in the cognitive dissonance theory for a communicator.

IV. The ethnic, religious and cultural conflicts in the world have their roots in ethnocentrism. Examine the relevance of intercultural communication competence in the 'global village'.

V. Information or innovation diffusion pattern changes with the advancement of technology. Substantiate it with scientific studies in the area.

VI. 'Media is the fourth estate.' Examine Edmund Burke's statement making an assessment of the performance of the media in a democracy.

VII. What are the key factors of persuasive communication?

MCJ: Second Semester

MCJ 2C 08: RADIO PRODUCTION

Module I

History of radio – Maxwell, Hertz, Marconi, Nicolas Tessla, Jagdish Chandra Bose, Lee De Forest, Charles Fesenden and others; radio as a military/naval communication instrument; radio becomes part of mass media; growth of radio up to 1950s; advent of television; revival of radio in the fragmented post-modern society ,Private FM & community radio. History of radio in India from 1921- Indian radio and colonial legacy; radio in the post-independence era

Module II

Radio station- objectives, policies and ethics. `Radio with commercial interests; radio and popular culture; radio's role in disaster management

Module III

Radio news – local, regional, national, and global news; scripting for radio news; news personnel and the organizational structure; language and style of news bulletins; news magazines; news flashes; structure of a news bulletin; voice cast

Module IV

Written and spoken language for broadcast; role of written script; live presentation; local slang and 'standard' language in broadcasting; voice modulation techniques; intimacy; formal and informal presentation; narrowcasting and presentation styles; RJs, DJs and radio hosts

Module V

Radio formats - music in radio; art of interviewing; radio play as 'Minds' Theatre'; creation of radio persona in chat shows; stock characters, Special audience programme-women, agricultural/farm, youth and children, radio magazine

Module VI

Commercials - making commercials, revenue generation, audience research, customised programmes, brand building of radio, publicity of programmes and radio channels, audience response, selling of radio personality, sources of advertisement, marketing techniques, creation of advertisements and jingles

Module VII

The technical side of broadcast - the physics of sound generation; Transmission methods-AM, FM, SW; Digital sound formats- MP2, MP3,WAV

Books for Reference

1. Stanley J. Baran, **Introduction to Mass Communication**, McGraw Hill
2. Robert McLeish, **Radio Production**, Focal Press
3. Vanita Kohli-Khandekar, **The Indian Media Business**, Response Books

Books for Further Reading

1. Paul Chantler and Peter Stewart, **Basic Radio Journalism**. Focal Press
2. U. L. Baruah, **This is All India Radio**.
3. Andrew Boyd, **Broadcast Journalism, Techniques of Radio and Television News**
4. Esta De Fossard, **Writing and Producing Radio Dramas,** Sage Publications
5. K. Tim Wulfemeyer, **Beginning Radio–TV News Writing**, Surjeet Publications
6. K. Tim Wulfemeyer, **Radio–TV News Writing Workbook**, Surjeet Publications
7. Carl Hausman, Philip Benoit and Lewis Donnell, **Modern Radio Production, Programming and Performance**
8. Robert L. Hilliard, **Writing for Television, Radio, and New Media,** Wadsworth
9. **Encyclopaedia of Broadcasting: Television and Radio**, **Vol. I, II & III**
10. G.P.S. Nair, ***Radio Smaranakal***
11. Thikkodiyan *,* ***Arangu Kanatha Natan***
12. ***P. Bhaskarante Jeevithavum Kalayum***
13. K. A. Beena***, Radio: Kalayum Kathayum***

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

2. Attendance : 4 Marks

Allotment of marks as per University regulations.

3. Assignments : 2.5 Marks

4. Seminar : 2.5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper
MCJ Degree Examination

MCJ 2C 08: RADIO PRODUCTION

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following.

1. Radio, the universal medium
2. RJs
3. F M radios
4. Community radio
5. Phone-outs
6. Running commentaries

II. Elaborate the role of radio in disaster management with examples.

III. Is radio a momentary medium? Discuss the effectiveness of communication through radio in Kerala

IV. Write a news script for the morning bulletin on *Thiruvonum* (Hints: Govt. withdraws load shedding, Onam markets to be extended up to Christmas, President to visit Kerala in October, 60 suspected killed in a plane crash in US). ..

V. Suggest five new radio formats, with title and target audience.

VI. Make a comparative analysis of the presentation techniques of private FM channels and AIR's medium wave channels.

VII. Discuss the plus and minus points of the proposal to grant news bulletins on private FM stations.

VIII. Is state-funding of public service broadcasters required in India in the changing scenario? Elaborate.

MCJ: Third Semester

MCJ 3C 09: Public Relations and Corporate Communication

Module I

Definition of public relations; evolution of public relations; history of PR in India; scope and functions of public relations; PR and propaganda; PR and corporate advertising; publicity and public relations.

Module II

Organizational set-up of public relations departments/agencies; public relations in private and public sectors; Central and State Government public relations departments; PR campaign; PR tools; Government media units and their functions; Role and responsibility of PRO

Module III

Public relations and spin doctoring, PR professionals and political image management, lobbying, packaging, merchandising, customer care, e-marketing, crisis resolution and communication

Module IV

PR and media relations – issuing news releases, holding briefings and news conferences, organizing facility visits, sponsorship and exhibitions, producing newsletters, house journals and brochures, new media, PR and public, trade union relations, customer relations, employee relations, community relations, and stockholder relations

Module V

Corporate Communication- definition, Corporate identity and corporate image; corporate culture and corporate citizenship; functions of corporate communicator, corporate social responsibility; public relations and corporate community involvement; public relations and corporate reputation

Module VI

PR professional organizations; PR code of ethics

Books for Reference

1. Joseph Fernandez**, Corporate Communications: A 21st Century Primer**, Response

2. Philip Kitchen & Don Schultz, **Raising the corporate umbrella: Corporate communications in the 21st Century**, Palgrave.

3. Sumantra Ghoshal, **World Class in India,** Penguin

4. Philip Lesly, **Handbook of Public Relations & Communications**, Jaico

5. Jaishri Jethwaney, **Public Relations: Concepts, Strategies and Tools**, Sterling

6. Sam Black, **Practical Public Relations**, Universal Books

7. C.S. Rayadu & K. R. Balan, **Principles of Public Relations,** Himalaya Publishing House

8. Alison Theaker, **The Public Relations Handbook**, Routledge

9. G.C. Banik, **PR& Media Relations**, Jaico

10. P. R. Smith, **Marketing Communications**, Kogman Page India

Books for Further Reading

1. Anil Basu, **Public Relations: Problems & Prospects with Case Studies,** Image Publications

2. CEOs of leading PR Firms**, The Art of Public Relations,** Vision Books.

3. B.N.Ahuja & S.S. Chhabra, **Advertising & Public Relations,** Surjeet Publications

4 Scott.M. Cutlip & Allen H.Center, **Effective Public Relations,** Prentice Hall

5. **India Business Yearbook**, Vikas Publications

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

2. Attendance : 4 Marks

Allotment of marks as per University regulations.

3. Seminar : 2.5 Marks

4. Assignments : 2.5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper

MCJ Degree Examination

MCJ 3C 09: Public Relations and Corporate Communication

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following:

1. Grapevine
2. E-marketing
3. Lobbying
4. Institutional advertising
5. Muckrakers
6. Open House

II. Differentiate between PR, advertising, publicity and propaganda.

III. What is the role of corporate communication in the image building of an organization?

IV. Public relations is today defined as "the deliberate management of public image and information in pursuit of organizational interests." Discuss.

V. Describe the organizational set-up of a PR department in the public sector and the function of its PR personnel.

VI. How does public relations influence public opinion? Discuss some of the ethical issues involved while executing PR campaigns.

VII. Assess the role of PR in crisis management.

MCJ: Third Semester

MCJ 3C 10: Advertising

Module I

History and evolution of advertising; defining modern advertising; key concepts of advertising; roles and functions of advertising – marketing, communication, economic, social; key players - advertiser, advertising agency, media, suppliers and target audience; types of advertising

Module II

Consumer Behavior – cultural, social, psychological and behavioral influences; consumer decision process; segmenting, targeting and positioning; branding

Module III

Advertisement copywriting for print – copywriter and advertising writing style, writing headlines, display copy and body copy, illustrations and photos, typography and design; Tools of copy writing-radio, television, web; planning and production of television commercials

Module IV

Potentials and limitations of different media in advertising; Media planning and buying – the aperture concept, media plan – media research, media objectives, media strategies and media buying; art and science of creative advertising and facets of creative strategy

Module V

Evaluation of advertising effectiveness – types and stages of evaluation, copy testing, media evaluation – audience exposure, and advertising ROI and media efficiency

Module VI

Advertising ethics – poor taste and offensive advertising, reinforcing stereotypes, body image and self-image, targeting children, misleading claims and other message strategies, adverting controversial products; professional organizations

Books for Reference

1. S.A Chunnawalla, **Advertising: An Introductory Text**, Himalaya Publishing House
2. Subrata Banerjee, **Advertising as a Career**, National Book Trust
3. J.V. Vilanilam and A. K. Varghese, **Advertising Basics: A Resource Guide for Beginners,** Sage Publications
4. Wells, Moriarty and Burnett, **Advertising: Principles and Practice,** Pearson Education

Books for Further Reading

1. George Belch, **Advertising and Promotion**, Tata McGraw-Hill
2. S.H.H. Kazmi and Satish Batra, **Advertising and Sales Promotion**, Excel Books
3. S.N. Murthy and Ubhojana, **Advertising: An IMC Perspective**
4. Littlefield and Kirkpatrick, **Advertising, Mass Communication and Marketing**
5. Otto Kleppner, **Advertising Procedures**
6. Sandage and Frybuger, **Advertising Theory and Practice**
7. Roger Barton, **Handbook of Advertising**

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

2. Attendance : 4 Marks

Allotment of marks as per University regulations.

3. Seminar :2.5 Marks

4. Assignments :2.5 Marks

III. End Semester Examination: 60 Marks

Model Question Paper

MCJ Degree Examination

MCJ 3C 10: Advertising

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks**.**

I. Write short notes on any four of the following.

1. Niche market
2. Yellow pages
3. Guerilla marketing
4. Off-line advertising
5. Media aperture
6. Jingles

II. Discuss the roles and functions of advertising within society and business.

III. Critique the key ethical issues that challenge the practice of advertising.

IV. Describe how the consumer decision process works.

V. Explain the key concepts of media planning and buying

VI. Explain the basic stylistics of advertising copy

VII. What are the ethical issues in advertising?

VIII. Prepare a print ad for a new English magazine to be launched shortly.

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MCJ: Third Semester

MCJ 3C 11: Mass Communication Research

Module I

Nature and scope of research; development of mass media research; an evaluation of communication research in India, media research and scientific method; methods of knowing; characteristics of scientific method; academic and applied research

Module II

Research procedures – determining topic relevance, review of literature, hypothesis formulation, conceptualization and theory building, research design, sampling techniques, data collection, statistical tests, data analysis and interpretation, research reporting, conclusions and recommendations; statistical packages for data analysis (SPSS)

Module III

Elements of research – concepts and constructs, variables and measurements, reliability and validity; sampling – probability and non-probability samples, sample size and sample error

Module IV

Qualitative research methods – field observations, focus groups, intensive, interviews and case studies; content analysis – uses and limitations, steps, examples, reliability and validity

Module V

Survey research – descriptive and analytical surveys, advantages and disadvantages, constructing questions, questionnaire design, pre-testing, data collection and analysis; longitudinal research – development and types of longitudinal studies; experimental research – advantages and disadvantages of laboratory experiments, conducting experimental research, experimental design and field experiments

Module VI

Measures of central tendencies – computation of mean, medium and mode; measures of dispersion- range, mean deviation, standard deviation; measures of variance; skewness and correlation tests – chi-square, f-test, t-test and ANOVA

Module VII

Thesis style(APA) – bibliography, indexing, abstracting, reference, citation, appendix and manuscript preparation

Books for Reference

1. Roger D. Wimmer & Joseph R. Dominick, **Mass Media Research**, Thomson

2. Barrie Gunter, **Media Research Methods**, Sage

3. Arthur Asa Berger, **Media Research Methods**, Sage

4. John Adams, **Research Methods for Graduate Business and Social Science Students**, Response

5. Arthur Asa Berger, **Media and Communication Research** Methods, Sage

6. Anders Hansen et al., **Mass Communication Research Methods,** Macmillan

7. Gerianne Merrigan & Carol Logan Huston, **Communication Research Methods**, Thomson

Books for Further Reading

1. Klaus Krippen Dorff, **Content Analysis: An Introduction to its Methodology**, Sage
2. Susanna Horning Priest, **Doing Media Research**: **An Introduction**, Sage
3. David Dooley, **Social Research Methods**, Prentice Hall

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

2. Attendance : 4 Marks

Allotment of marks as per University regulations.

3. **Seminar : 2.5 Marks**

4. **Assignments : 2.5 Marks**

II. End Semester Examination: 60 Marks

Model Question Paper

MCJ Degree Examination

MCJ 3C 11: Mass Communication Research

Time: 3 Hours **Max. Marks: 60**

Answer question I and FOUR others. All questions carry equal marks

I. Write short notes on any four of the following:

1. Likert Scale
2. T-test
3. Independent variable
4. Snowball sampling technique
5. Standard deviation
6. Normal curve

II. What are experiments? Differentiate between laboratory experiments and field experiments.

III. Define probability sampling and explain three most commonly used probability sampling methods.

IV. Define content analysis. Explain the steps involved in analyzing development news in two Malayalam dailies of your choice.

V. Prepare a questionnaire to collect data on college students' demographic variables and their TV viewing habits with special reference to Malayalam TV. Channels. The items in the questionnaire should be structured to assess the popularity of the channels as well as the popularity of the programmes broadcast by the channels.

VI. Explain the salient features of nominal, ordinal and interval data in communication research.

VII. Evaluate the status of communication research in India.

VIII. Find the standard deviation for the following frequency distribution of scores:

Class Interval	**f**
17 – 19	1
14 – 16	2
11 – 13	3
8 – 10	5
5 – 7	4
2 - 4	2

MCJ: Third Semester

MCJ 3C 12: Television Journalism

Module I

Organizational structure of a television news channel; bureau and desk operation; television news terminology

Module II

Television reporting – qualities and responsibilities of a television reporter; news formats - O-C, O-C VO, O-C VO SOT, O-C Graphics, O-C SOT, O-C Live, O-C Phono and O-C Package; ENG and DSNG; Piece To Camera (PTC) – stand-up, stand-up close, stand-up open and signature line, Live news reporting – straight-up live, live with interview, live with SOT, live with VO, live with VOSOT and live with package; breaking news; techniques of live telecast

Module III

Television news structure –headlines, teaser and teller leads, body and tag; subbing reporters', news agency and citizen journalists' copies; writing voice-over; studio package; rundown preparation TV news language, ingredients of TV newscast

Module IV

Production Control Room (PCR) operation; role and responsibilities of producer, news editor, assignment editor, visual editor and graphics editor

Module V

Television interviews – opinion interview, information interview, news interview, filed interview, vox pop and personality interview, interviewing techniques; panel discussion, News based programmes-debates, satirical programmes etc..

Module VI

Television news anchoring; qualities of a news anchor; aesthetics of presentation – speed, breath, gesture, posture, facial expressions, pitch, pace, pause and duration

Module VII

Scoops and exclusives; New media tools and news breaking; sting operation – legal and ethical issues; critical analysis of leading English and Malayalam news channels; current trends and challenges

Books for Reference

1. Ivor Yorke, **Television News**, Focal Press
2. Zettl, **Television Production Handbook**, Wadsworth
3. Andrew Boyd, **Broadcast Journalism, Techniques of Radio and Television News,** Focal Press
4. Ted White, **Broadcast News Writing, Reporting and Production**
5. Gerald Millerson, **Effective TV Production**
6. Browssard and Holgate**, Broadcast News**
7. Fletcher, **Professional Broadcasting**

Books for Further Reading

1. Eric K. Gormly, **Writing and Producing Television News**, Surjeet Publications
2. Robert L. Hilliard, **Writing for Television, Radio, and New Media**, Wadsworth, 2004
3. Rick Thompson, **Writing for Broadcast Journalism,** Routledge.

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module seven.

2. Attendance : 4 Marks

Allotment of marks as per University regulations

3. Interview Assignment : 5 Marks

Students divided into teams of four members each, shall produce a 20-minute personality interview and submit for valuation.

II. End Semester Examination: 60 Marks

Model Question Paper

III Semester MCJ Degree Examination

MCJ 3C 12: Television Journalism

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following.

1. Breaker
2. Bump
3. Evergreen
4. Rundown
5. PTC
6. TRP

II. Explain the various steps involved in a television interview.

III. Discuss the role of a television reporter in the current scenario

IV. Prepare a 20-minute television news bulletin in the split-page format using current events

V. Explain the traits of a successful news anchor

VI. Compare any two national television news channels and assess their role in Indian democracy.

VII. Elucidate the challenges of reporting live news

VIII. "With the onslaught of 24-hour television news channels, events are either sensationalized or trivialized." Comment.

MCJ: Fourth Semester

MCJ 4C 13 : Introduction to Cinema

Module I

Lumiere Brothers, the era of silent movies, evolution of sound films and major cinema movements - German expressionism, Soviet montage, Italian neo-realism and 'French New Wave'; Hollywood cinema, Japanese cinema; Indian new wave cinema; Current trends: in Latin American, South Korean, and Iranian cinema.

Module II

Film genres – romantic comedies, romantic drama, cops and robbers, gangsters, sci-fi fantasy, detective, funny, spoofs, thrillers, horror, religious, suspense, courtroom, musicals, history, epics, war and others.

Module III

Film terminology; characteristics, potentials and limitations of cinema; types of films - feature films, documentaries, short films, animations and others; art versus commercial cinema;

Module IV

Film direction – qualities and responsibilities of a film director, world's great directors; acting – challenges and responsibilities, world's great actors.

Scripting for short films and documentaries - format, scripting steps, storyboarding, shooting script and script breakdown.

Module V

Brief history of documentary; characteristics and functions of documentary; Types: cinema direct, cinema verite, interactive documentary, observational documentary, expository documentary, and reflexive documentary.

Module VI

Shooting - camera as storyteller, composition of shot; Types of shot- size of shots; camera movements; camera angle; continuity; lighting. Production management in cinema-shooting schedule, budgeting, casting, sets, props, wardrobe and makeup; location management.

Visual editing - editing techniques and transition devices; sound editing – spotting, on-screen sounds, ambient sounds, off-screen sounds, synchronous and asynchronous sound, background and foreground music, dialogue tracks, sound effects, music tracks and re-recording

Movies For Viewing And Analysis

Movies by Lumiere Brothers:

Arrival of a Train

Gardener with a watering hose

Workers Leaving the Factory

Demolition of a wall

Breakfast scene

Other Movies

1. A Trip to Moon by George Melies
2. The Birth of a Nation by D.W. Griffith
3. The Cabinet of Dr. Caligari by Robert Wiene
4. Battleship Potemkin by Sergei M. Eisenstein
5. Modern Times by Charles Chaplin
6. The Grand Illusion by Jean Renoir
7. Citizen Kane by Orson Welles
8. Bicycle Thieves by Vittorio De Sica
9. Rashomon by Akira Kurosawa
10. Roman Holiday by William Wyler.
11. Pather Panchali by Satyajit Ray
12. Wild Strawberries by Ingmar Bergman.
13. The Godfather by Francis Ford Coppola.
14. Pyaasa by Guru Dutt.
15. Hiroshima, mon amour by Alain Resnais.
16. Breathless by Jean-Luc Godard.
17. Knife in the Water by Roman Polanski.
18. Bhuvan Shome by Mrinal Sen.

19. Jules and Jim by François Truffaut.
20. Ankur by Shyam Benegal.
21. One who flew over the Cuckoo's Nest by Milos Forman.
22. Elipathayam by Adoor Gopalakrishnan.
23. Nayakan by Mani Ratnam.
24. Amma Ariyaan by John Abraham.
25. Piravi by Shaji N. Karun.
26. Through the Olive Trees by Abbas Kiarostami.
27. Postino by Michael Radford.
28. The Cyclist by Mohsen Makhmalbaf.
29. Gulabi Talkies by Girish Kasaravalli.
30. Spring, Summer, Fall, Winter... and Spring by Kim Ki-duk.
31. Veedu by Balu Mahendra.
32. Run Lola Run by Tom Tykwer.
33. The Day I Became a Woman by Marzieh Meshkini.
34. Thoovanathumbikal by P Padmarajan.
35. Traffic by Rajesh Pillai.

Documentaries for Viewing and Analysis:

1. **Born into Brothels**, directed by Ross Kauffman and Zana Briski.
2. **Bowling for Columbine,** directed by Michael Moore.
3. **Fahrenheit 9/11, d**irected by Michael Moore.
4. **The Fog of War**, directed by Errol Morris.
5. **March of the Penguins**, directed by Luc Jacquet.
6. **The Man with the Movie Camera**, directed by Dziga Vertov.
7. **Ram Ke Naam,** directed by Anand Patwardhan.
8. **Bombay Our City,** directed by Anand Patwardhan.
9. **Hey Ram!! Genocide in the Land of Gandhi,** directed by Gopal Menon.
10. **The Fire Within,** directed by Shri Prakash.

11. **PAPA 2,** directed by Gopal Menon.
12. **Have you seen the arana?** (Ningal aranaye kando?), directed by Sunanda Bhat.
13. **Salesmen**
14. **Glass**
15. **Zoo**

Books for Reference

1. Bernard F Dick,**Anatomy of Film,** St. Martin Press, New York, 1978
2. John Russo, **Making Movies,** Dell Trade, 1989.
3. Susan Hayward, **Key concept in Cinema studies**, Routledge, 2004.
4. Louis Giannetti, **Understanding Movies,** Simon and Schuster Company, USA
5. Nathan Abrlams, Ian Bell and Jan Udris, **Studying Film**
6. J. Dudley Andrew, M**ajor Film Theories: An Introduction**.
7. Tom Holden, **Film Making**
8. Brain Brown, **Cinematography: Theory and Practice**.
9. Stanley J. Baran, **Introduction to Mass Communication**
10. Keval J. Kumar, **Mass Communication in India',** Jaico Publishing House
11. Anwar Huda, **The Art and Science of Cinema**, Atlantic Publishers
12. H.N. Narahari Rao, **The most Memorable Films of the World**, Prism Books
13. Sheila Curran Bernard, **Documentary Storytelling**, Focal Press, 2007.
14. Jag Mohan, **Documentary Films and Indian Awakening**, Publications Division, Films Division, 1990.
15. Michael Rabiger, **Directing the Documentary**, Focal Press.
16. Arthur Asa Berger, **Script Writing for Radio and Television**, Sage Publications.

Books for Further Reading

1. James Monaco, **How to Read a Film**, Oxford University Press, 2000.
2. Nick Lacey, **Introduction to Film**, Palgrave **Macmillan, 2005.**

3. Shohini Chaudhuri**, Contemporary** World Cinema, Edinburgh University Press, 2005.
4. Yves Thoraval, **The Cinemas of India**, Macmillan, 2000.
5. David K. Irving and Peter W. Rea, **Producing and Directing the Short Film and Video**, Focal Press, 2006.
6. Mike Wolverton, **Reality on Reels: How to Make Documentaries for Video/Radio/Film**, Surjeet Publications, 2005.
7. Rajiv Mehrotra, **The Open Frame Reader: Unreeling the Documentary Film**

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

2. Attendance : 4 Marks

Allotment of marks as per University regulations

3. Film Analysis : 5 Marks

Each student shall make a critical study of a celebrated filmmaker and make a power-point presentation.

II. End Semester Examination: 60 Marks

Model Question Paper

MCJ Degree Examination

MCJ 4C 13: Introduction to Cinema

Time: 3 Hours **Max. Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following.

1. Mise-en-scene
2. Expressionism
3. Avant-garde
4. Classical cutting
5. Montage
6. Cinema verite

II. Compare and discuss ‘Born into Brothels’ and ‘Bombay Our City.’

III. What is docudrama and how does it differ from other forms of documentary?

IV. Prepare a proposal for a documentary film with all the required stages of documentary filmmaking on any one of the following topics:

1. Kuttanad: The Rice Bowl of India

2. A Self-help Group in Kerala

V. Comment on the father of documentary, elucidating his contributions.

VI. Analyse and compare any two movies / documentaries of a director of your choice.

VII. Trace the history of Malayalam cinema, with its ups and downs. .

VIII. Explain the differences between the production process of documentaries and short films.

MCJ: Fourth Semester

MCJ 4C 14: NEW MEDIA AND ONLINE JOURNALISM

Module I

Basics of Internet; History of Internet, how Internet works — the web and the file transfer — Usenet and news groups — Researching via Internet — emerging trends.

Module II

Electronic Environment; News gathering, processing, visual storytelling, news content in online environment,Journalism via Internet.

Module III

Online Journalism; The rise of online news, breaking news — scoops- facts and fakes — immediacy, depth and interactivity, confirming authenticity; emerging trends; online newsgathering.

Module IV

Online reporting-writing style and packaging for online news;
Crisis and scandals, redefining news, alternative perspectives, truth, objectivity and fairness — cases studies, emerging trends in online reporting.

Module V

Participatory and Citizen Journalism; Reporting in the liberalized era - People's news source, news on demand, digital citizens; communicating crisis.

Module VI

New Media: legal and ethical communications; Origin and development of new media, crossing thresholds, communities of interest, trends.
Ethical issues in online journalism - copyright issues, regulating online practices, plagiarism; IT Act 2000.

Books for reference

1. Allan, Stuart : Online News
2. Bakardjieva, Maria : Internet Society
3. Jagdish, Chakravarthy : Cyber Media Journalism, Emerging Technologies

4. Jones G Steven : Cyber Society
5. Whitaker, Jason : The Internet, The Basics

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six

2. Attendance : 4 Marks

Allotment of marks as per University regulations

3. Seminar : 2.5 Marks

4. Assignments : 2.5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper
MCJ Degree Examination

MCJ 4C 14: New Media and Online Journalism

Time: 3 Hours **Max. Marks: 60**

Answer question I and FOUR Others. All questions carry equal marks

I. Write short notes on any four of the following

1. Information Highway
2. E-newspapers
3. E-zine
4. WhatsApp
5. Blog writing
6. Ethical Hacker

II Explain the advantages and disadvantages of Web Journalism

III Explain relevance of Internet in Print, Broadcast Media and Films

IV Duties and responsibilities of On-line Editors'

V Illustrate Web radio and Web TV

VI Explain digital divide

VII what are the challenges faced by online journalism in India?

VIII what is Participatory Journalism? Explain with suitable examples

ELECTIVE PAPERS

Second Semester: Elective Course

MCJ 2E 01: PHOTO JOURNALISM

Module I

Evolution of photography- history and development, Types of Cameras- Single Lens Reflex (SLR), Twin Lens Reflex (TLR), Rangefinder Cameras, View Cameras, Polaroid Cameras, Super wide-Angle Camera, Panoramic Camera, Aerial Camera, Sub-miniature Camera; Digital Photography.

Module II

Lenses- focal length, Focus and Magnification; Lenses of normal, short and long focal length; convertible, enlarging, perspective, supplementary, zoom and Macro lenses; Lenses and Composition- Aperture Settings, Shutter Speed and Depth of field

Module III

Visualization of A Photograph- Characteristics of A Photograph, Composition, Point of View, Framing, Horizontal and Vertical Format, Centre of Interest, Horizontal Line, Near-Far Relationship, Time of Day And Decisive Moment; Lighting-Front, Side, Back And Revealing Lights; Shooting in Artificial and Mixed Light

Module IV

Scope and Significance of Photojournalism, News Photographs, Advertisements Photographs, Wild Life Photographs, Sports Photographs; Review of Photography Magazine; Leading Photojournalists in India; International Photojournalists; Ethics in Photo Journalism; Paparazzi Journalism; Photo Essay; Freelance Photography.

Module V

Editing Photographs- Transferring Photographs to a personal Computer; Photo Selection, Cropping, Scaling and Toning; Photo Editing Software

Books for Reference:

Arthur Rostein : Photo Journalism

B K DeshPandey : Photo Journalism

Huy : Photo Journalism (the visual approach)

Jonathan Hilton : Action photography

Lewis : Photo journalism: Content and technique

Lizwells : The photography reader

Loup langton : Photo journalism and today's news

Rick Samon's : Complete guide to Digital photography

Salomon : Advertising photography

Scharf : Pioneers of photography

Steve Bavister : Digital photography

Walden : Photography and Philosophy

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

2. Attendance : 4 Marks

Allotment of marks as per University regulations

3. Seminar : 2.5 Marks

4. Assignments : 2.5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper
MCJ Degree Examination

MCJ 2E 01: Photo Journalism

Time: 3 Hours **Total Marks: 60**

Answer question I and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following.

1. Portraits
2. Shutter speed
3. Filters
4. Depth-of-field
5. Colour balance
6. Rule of the Thirds

II. Trace the history of photo journalism

III. What are the salient features of advertisement photography?

IV. Explain the challenges in sports photography.

V. Briefly analyse the traits and qualities of a wild-life photographer

VI. "Photographs are the paintings with light" -discuss the creative side of photography

VII. Explain the various types of camera lenses used for special tasks.

VIII. Evaluate the scope of photography and editing in the digital world

Second Semester: Elective Course

MCJ 2E 02 : Travel Journalism

Module I

Travel Journalism: Significance, relevance and scope, Role and responsibility of mass media in travel and tourism industry

Module II

Writing for Travel magazines, tourism brochures , travel books and travel e-zines; Tourism and hospitality industry and packages; Reporting -Travel marts, Calendar festival, fashion and food.

Module III

Travel writing: Narrative journalism, Personalized reporting and non –fiction writing.

Travel writers- William Dalrymple, Vikram Seth, Anita Nair, Dilip D'Souza, Samanth Subramanian, S K Pottakkad, M T Vasudevan Nair, Raveendran, Sakariya and Santhosh George Kulangara.

Module 1V

Content and packaging of major tourism magazines and Periodicals in English and Malayalam: review and analysis.

Module V

Role of photography and photo essays in travel writing

Books for Reference:

William Dalrymple : Nine Lives

Samanath Subramanian: Following Fish-Travels around the Indian coast

Vikram Seth: From Heaven Lake- Travels Through Sinkiang and Tibet

Dilip D'Souza: Road Runner

Anita Nair: The elephants are coming and other essays

S K Pottakad: London Notebook

M T Vasudevan Nair: Manushyar, Nizhalukal

Raveendran : Akalangalile Manushyar

Raveendran: Budha Padham

Zachariya : Nabiyude Nattil

Zachariya: Bum Bum Hara Hara Bum Bum Bol!

Santhosh George Kulangara: Baltic Diary

I. Continuous Assessment : 15 marks

1. Class Test: 6marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

2. Attendance : 4 marks

Allotment of marks as per University regulations

3. Seminar : 2.5 marks

4. Assignments: 2.5 marks

II. End Semester Examination: 60 marks

Model Question Paper
MCJ Degree Examination

MCJ 2E 02: Travel Journalism

Time : 3 hours **Max. Marks : 60**

Answer question one and FOUR others. All questions carry equal marks.

I. Write short notes on any four of the following

1. 'Nabiyude Naattil'
2. Safari Channel
3. Discover India
4. Centre spread
5. Travel marts
6. Jithendra Singh

II. What are the qualities required for a good travel writer, also identify the essential ingredients for an effective travel piece.

III. What is the role and responsibility of new media in travel and tourism industry?

IV. What is the role of photo essays and maps in writing travel pieces for magazines and periodicals?

V. Create a brochure for KTDC for their upcoming heritage tourism package in North Malabar.

VI. 'Travel books and magazines are replaced by e-zines and advertisements'-Discuss the statement.

VII. Explain the role of William Dalrymple in popularizing travel writing.

Second Semester: Elective Course

MCJ 2E 03 : Health Communication

MODULE 1

Introduction to health Communication- Concept of health and Disease, Role of communication and campaigns in health and population programs

MODULE II

Communication process and principles applied to Health & population; various health policies of Indian governments and its communications via Mass media.

MODULE III

Media and Journalist: roles in health coverage; Non-traditional Media; Health Magazines; Print , Radio and Television: Health Information in News and Entertainment programs ;
Health Communication: in Blogs, podcasts and other e-media innovations; Risk and crisis of health communication in the media.
Health writing for print media: features, articles and columns.

MODULE IV

Communication Campaign –steps for conducting campaign- content and treatment of message; selection of the media, audience variable –monitoring feedback& evaluation- Preparation of stickers, posters, bill boards.

MODULE V

Health and family welfare programs in community-World Health Organization, UNICEF, Health campaigns in India- National health policy, India's population problem and National family welfare programs ;Campaign against Polio, AIDS/HIV, Malaria, Smallpox, Female infanticide, child mortality ,mother and baby care vaccinations.

Books for reference

1. Danger, fear and insecurity by Seale, Clive. (2002): Chapter 4 in Media and Health, p 67-92, Sage.
2. Mass Communication and Public Health: Complexities and Conflict by Charles Atkin, & Larry Wallack (Eds.)., Sage
3. Health Communication: From Theory to Practice by Renata Schiavo (2007), Jossey Bass, San Francisco
4. Handbook of Health Communication by Teresa L. Thompson.
5. Health Communication Message Design: Theory and Practice by Hyunyi Cho , Sage

I. Continuous Assessment: 15 marks

1. Class Test: 6 marks

There shall be two internal examinations within the semester: one, at the completion of module four and the second, at the completion of module five

2. Attendance : 4 marks

Allotment of marks as per University regulations

3. Seminar : 2.5 marks

Analysis of any two health magazines either in English or Malayalam

4. Assignments: 2.5 marks

II. End Semester Examination: 60

Model Question Paper
MCJ Degree Examination

MCJ 2E 03 Health Communication

Time : 3Hours **Maximum Marks : 60**

Answers question one and FOUR others. All question carry equal marks

I. Write short notes on any four of the following.

1. National Population policy
2. UNICEF
3. ASHA
4. Child mortality
5. SITE

6 ‘Aarogyam’

II. Analyze content of two health magazines.

III. Explain the role of radio in promoting health campaigns.

IV. Explain the crisis faced by the media while reporting health campaign in India.

V. Prepare a poster for any polio campaign.

VI. Detail the role of Television in spreading awareness about family welfare Programmes

VII. Explain the major components of health communication

Third Semester: Elective Courses

MCJ 3E 04: Indian Politics and communication

Module I

Political reporting from Colonial legacy; National Movement legacy; basic features and provisions of the Indian Constitution; linguistic organization of the States; regionalism.

Module II

Communication after independence: The Nehru era – major political parties and leaders, Congress and the Opposition; regional parties.

Module III

Political Communication: From Sastri to Indira Gandhi; Indira era – J.P. Movement and Emergency, Janata Coalition Government

Module IV

Media's role as political communicator: The Rajiv Years- Bofors and its aftermath; National Front Government; Pokhran II and Kargil War

Module V

Political agendas and reporting: Jammu and Kashmir; Punjab crisis; Mandal Commission, Babri Masjid, Godhra riots,2G Spectrum scam and current issues.

Land reforms; agrarian struggles; green revolution; globalization, liberalization and privatization

Module VI

Reporting Kerala politics – a critique on major political parties and their leaders in Kerala; an analysis of performance of political parties in Legislative and Lok Sabha elections; constituencies and members of legislative assembly; a critique of the Coalition Governments; profile on Kerala Chief Ministers

Books for Reference

1. Bipan Chandra, India after Independence, Penguin Books, 2000

2. Ramachandra Guha, India after Gandhi, Macmillan, 2007

3. Zoya Hasan, Parties and Party Politics in India, Oxford India, 2004
4. R. K. Pruthi, Prime Ministers of India, Indiana Publishers, 2006
5. Nandan Nilekani, Imagining India, Penguin Books, 2008
6. K. C. John, Kerala Rashtriyam, Oru Asambandha Natatakam, Pen Books, 1999
7. Cherian Philip, Kaal Nootandu

I. Continuous Assessment: 15 marks

1. Class Tests: 6 marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

2. Attendance : 4 marks

3. Seminar : 2.5 marks

4. Assignment: 2.5 marks

II. End Semester Examination: 60 marks

Model Question Paper
MCJ Degree Examination

MCJ 3E 04: Indian Politics and communication

Time: 3 Hours **Marks : 60**

Answer question I and FOUR others. All questions carry equal marks

I. Write Short Notes on any four of the following.

1. Chipko Movement
2. GNLF
3. JKLF
4. Kamaraj Plan
5. Mandal Commission
6. Operation Blue Star

II. "Coalition Government is a liability." Substantiate your view

III. How should India proceed for a permanent solution to the Kashmir issue?

IV. "Maoism is the biggest internal threat to India." Comment

V. "Communal politics is a dangerous trend in Kerala." Elucidate

VI. "Regional parties are hazardous to unity and integrity of the nation." Explain your stand.

VII. Make an objective analysis of the performance of the former UPA Government.

VIII. "Today the ideology of all the political parties seems to be same." Critically. examine this statement.

Third Semester: Elective Course

MCJ 3E 05 : Agricultural Journalism

Module I

Meaning, Nature, Scope and Characteristics of agricultural Journalism;Agricultural Movement in India,Media and Green Revolution; Role and Significance of Media in Agrarian Society; Status of Agricultural Journalism in India

Module II

Present Status of Production and Economic Condition of Farmers in India, The Present Agricultural Policy of India , Services and Implementation of Agriculture Related Departmental Programs; Agriculture and Indian economy.

Module III

Agricultural Media Reporting, Features, Interviews Articles, Analytical Stories, Techniques and Terminologies, Agricultural programs on TV Channels: Agricultural training centers - Communication program for farmers, extension training, Krishi mela and exhibition, loan mela, agricultural TV channel; Kisan TV, Kisan Vani, Agricultural radio program- Krishi ranga; Print: *Down to Earth* magazine.

Module IV

Agricultural supplements of Daily Newspapers, Agricultural Journals & Eminent Agricultural Scientists scientists Dr. M.S. Swaminathan, Dr. M. Mahadevappa (Paddy), L.Lakshmanaiah (Ragi), Dwarkanath (Extention technology) S.V. Rangaswamy, Narayana Reddy.

Module V

Recent trends and developments in Agricultural Journalism.

Reference Books :

1. Writing for farm families by Kamath,M.G

2. Mass Communication & Journalism in India .(2006) By Mehta D.S

3. Farm Journalism (2004) By Mukhopadhya

4 Claron Burnet: Agricultural news writing.

5. Nelson Antrim Cragard: Agricultural journalism.

6 Rodney Fox: Agricultural and Technical.

7 Agricultural news writing - Claron Burnett

8 Agricultural and Technical Journalism- Rodney Fox

9 The invisible farm - Thomas F Pawlick

10 Pioneer agricultural journalists - William E. Ogilvie

11.Agricultural journalism - Nelson Antrim Crawford 12.One straw revolution - Fukuoka Masanobu

I. Continuous Assessment: 15 marks

1. Class Tests: 6 marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

2. Attendance : 4 marks

3. Seminar : 2.5 marks

4. Assignment: 2.5 marks

II. End Semester Examination: 60 marks

Model Question Paper
MCJ Degree Examination

MCJ 3E 05 Agricultural Journalism

Time: 3 Hours **Marks: 60**

Answer question I and FOUR others. All questions carry equal marks

I. Answer any four of the following.

1. Dr. M.S Swaminathan
2. Agrarian society
3. Karshaka Sree
4. P.Sainath
5. Krishidershan
6. 'One-Straw revolution'.

II. Explain agricultural movements in India.

III. How Green Revolution helped Indian agricultural sector?

IV. Explain the role of media in agricultural development.

V. Write on Varghese Kurian and his contributions to White Revolution.

VI. Write on Agriculture and Indian economy.

VII. Detail meaning, nature, scope and characteristics of agricultural journalism.

Third Semester: Elective Course

MCJ 3E 06 : BUSINESS JOURNALISM

Module I

A foundational course on economics, covering all major schools of modern economic thinking - Classical, Neo-classical, Marxian, Keynesian and Monetarist

Module II

Milestones of Indian economy - Brief account of Indian economy on the eve of independence and after; process of the finalization of first five-year plan, general overview of Nehruvian model, bank nationalization, green revolution, control and permit raj and liberalization of the 1990s.

Module III

Business reporting and editing **-** corporate reporting; banking; policy-making institutions; market reporting- stock market, currency exchanges markets and commodity markets; regulatory bodies; company law; budget; trade policies

Module IV

Business newspapers, magazines, news agencies and television channels - A straight narrative on business dailies and magazines in the country as well as abroad - Wall Street Journal, Financial Times (London), The Economic Times, The Financial Express, Business Line, Economist, Fortune, Outlook Money, Outlook Business, Business Today, Business World and Business India; 24x7 television channels dedicated to business – CNBC, NDTV Profit and others; financial and data service wire agencies - NewsWire18, Reuters, Bloomberg, Dow Jones and others; Role of major dailies like Manorama, Mathrubhumi and the Hindu in covering business stories linked to Kerala; Specialized business journals: Business Today, Business Line, Dhanam, Business Deepika etc.

Module V

Salient features of Kerala economy on a national and global perspective - debate on Kerala model of development and the linkages of the state's economy with global markets; Cash crops in Kerala.

Books for Reference

1. Adam Smith*, Wealth* of *Nations*

2: Karl Marx, *Das Capital*

3: John Maynard Keynes, *General Theory of Employment, Interest and Money*

4. Joseph Schumpeter, *Capitalism, Socialism and Democracy*

Books for Further Reading

1: Paul M Sweezy*, The Theory of Capitalist Development* (It is a classic text on understanding Marxist political economy)

2: Michael Lewis, *Liar's Poker* (It is a roller-coaster description of what really happens in Wall Street, the Mecca of Global financial markets. A good read for any aspiring journalist)

3: Robert Shiller, *Irrational Exuberance* (It is another work taking a close look at the functioning of financial markets)

4: Noureil Roubni, a professor at Stern School of Business is widely credited with predicting the 2008 global financial crisis. He is a much sought after economist at present. *Political Cycles* and *Marco Economy and Bailout and Bail-in* are two books by him, which provide a perspective on economic meltdowns.

5: C.T. Kurien, *Global Capitalism and Indian Economy*, provides a good understanding of Indian economy on a global perspective. *Rethinking Economics,* reflections based on a study of Indian economy is also a good work for students.

6: Jagadish Bhajwati, a professor of Columbia University, long considered as a potential candidate for Nobel Prize in economics, is an ardent supporter of the liberalization, privatization and globalization theme. His book, *In Defense of Globalization,* is a good read.

7: John Bellamy Foster, *The Great Financial C*risis is a very good book on the 2008 global financial crisis.

8: Robert McCheseny, *The Political Economy of Media* It is a very good book on linkages between big business groups and media in the U.S. The methodology used by McChesney could be extended to analyze media situation even in our country.

9. *Dollars and signs* is a very good internet site on business journalism

10: Robert Brenner, *The Boom and the Bubble: The US in World Economy* provides a lucid account of the role of American economy in driving global developments

11: Dr. K. K. George, *Limits to Kerala Model of Development p*rovides a good introduction to the chronic problem of fiscal deficits in Kerala

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

2. Attendance : 4 Marks

Allotment of marks as per University regulations

3. Seminar : 2.5 Marks

4. Assignments : 2.5 Marks

.

II. End Semester Examination: 60 Marks

Model Question Paper
MCJ Degree Examination

MCJ 3E 06 : Business Journalism

Time: 3 Hours **Max. Marks: 60**

Answer question I and FOUR others. All questions carry equal marks.

I. Write short notes on any FOUR of the following:

1. Business Cycle
2. SEBI
3. Sensex
4. NIFTY
5. FMC
6. Credit Policy

II. Trace the origin and development of modern stock exchanges.

III. Economic planning is not the best way for achieving rapid economic growth.

Do you agree with this statement in the context of the history of Indian economic growth?

IV. Write an essay on the significance of credit policy of Reserve Bank of India

V. Elucidate the role of World Bank and IMF as multi-lateral funding agencies

VI. What are the merits and de-merits of futures trading in agriculture commodities?

VII. Detail India's union budget making process

VIII. Detail the role of business television networks in spreading awareness about financial markets to a larger audience

MCJ: Third Semester: Elective Course

MCJ 3E 07 : Development Communication

Module I

First, second and third world; concepts of development; reasons for underdevelopment; indicators of development; empowerment and development communication; psychological and socio-economic constraints on development, development and globalization.

Module II

India's communication revolution from bullock cars to cyber marts; television and social change: SITE, Kheda and Jhabua communication projects, *Hum Log*; radio for development communication; community radio; print media and development communication; new media and development; folk/traditional media and development communication.

Module III

Theories and models of development – Adam Smith, Ricardo, Malthuse, Rostow, Marx and Mahatma Gandhi; modernization and dominant paradigm of development; sustainable and participatory development; Liberation theology – Paolo Freire, Brazilian experience, Sarvodaya Shramadana Movement in Sril Lanka, family life education in Ghana.

Module IV

Development communication models – Lerner, Schramm, Rogers; pro-persuasion model of development; mass media model of development; New World Information and Communication Order and McBride Commission Report; UNESCO Declaration on mass media.

Module V

Kerala model of development – Kerala's paradoxes, Kerala's industrial development, impact of migration on Kerala's economy and society, Kerala health model, People's Plan; media and development in Kerala.

Books for Reference

1. Wilbur Schramm, **Mass Media and National Development**
2. Lerner**, The Passing of a Traditional Society**
3. Dube S.C., **India's Changing Villages: Human Factors in Community Development**
4. Srinivas Melkote & Leslie Steeves, **Communication for Development in the Third World**
5. Kuppuswamy, **Social Change in India**
6. Y.V.L. Rao, **Communication and Development**
7. Cheng, **Media Policies and National Development: Characteristics of 16 Asian Countries**
8. Majid Tehranian, **Communication Policy for National Development**
9. Thomas Friedman, **The World is Flat**
10. Singhal Rogers, **India's Communication Revolution: From Bullock carts to Cyber Marts**
11. J.P. Yadav, **Television and Social Change, Vol. I & II**
12. P. Sainath, **Everybody Loves a Good Drought**
13. Joseph Tharamanagalam, **Kerala: The paradoxes of Public Action and Development**
14. P. Surendran**, The Kerala Economy: Development, Problems and Prospects**

I. Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

2. Attendance : 4 Marks

Allotment of marks as per University regulations

3. Seminar : 2.5 Marks

4. Assignments :2.5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper
MCJ Degree Examination

MCJ 3E 07: Development Communication

Time: 3 Hours **Max. Marks: 60**

Answer question I and FOUR Others. All questions carry equal marks**.**

I. Write short notes on any four of the following.

1. Kheda communication project
2. Radio rural farm
3. Pro-development soap opera
4. Krishi Darshan
5. Environmental journalism
6. Extension communication

II. Discuss with the help of examples the potential of radio as a medium for rural development in India.

III. Critically evaluate Lerner's model of development communication.

IV. What are the criticisms leveled against the dominant paradigm of development?

V. Discuss the merits and demerits of the Kerala Development Model.

VI. What are the indicators of development? How can they be applied universally?

VII. Critically analyze W.W. Rostow's five-stage theory of growth.

VIII. Summarize the major theories of development communication proposed by Wilbur Schramm.

Fourth Semester: Elective Course

MCJ 4E 08: Technical Writing

Module I

Technical writing: definition- technical writing and other forms of writing, roles and functions of technical communicators in software and IT companies- Roles and responsibilities of technical writers and editors.

Module II

Stages in the preparation of a technical document - pre-writing, writing and post-writing; audience and task analysis; technical writing techniques - data collection methods, working with Subject Matter Experts (SMEs), collecting and organizing information, drafting information verbally and visually, working with images and illustrations and storyboarding.

Module III

Technical Writing Style Guide-Technical editing process: editing for accuracy, language and style; technical writing software tools.

Module IV

End products of Technical writing: reports, memos, proposals, letters, abstracts and user manuals.

Module V

Technical writing practice: ethics and other issues.

Books for Reference

1. Raman Sharma, **Technical Communication,** Oxford University, 2004
2. Barry J. Rosenberg, **Technical Writing for Engineers and Scientists,** Massachusetts, May 2005.
3. Paul V. Anderson, **Technical Communication A reader centered Approach**, New Delhi, Rahul Print O Pack, 2007.
4. Riordan Pauley**, Technical Report Writing Today**, Biztantra, 2004
5. Donald W Bush & Charles P Campbell, **How to Edit Technical Documents** Universities Press, 1995

6. Jason Whittaker, **Web Production for Writers and Journalists**, Routledge, 2002
7. Straubhaar La Rose, **Media Now**, Thomson Wadsworth, 2004
8. Stephen Quinn, **Digital Sub-editing and design**, Focal Press, 2001

I. Continuous Assessment: 15 marks

1. Class Tests : 6 marks :

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

2. Attendance : 4 marks

3. Seminar: 2.5 marks

4. Assignment : 2.5 marks

II. End Semester Examination: 60 marks

Model Question Paper
MCJ Degree Examination

MCJ 4E 08: Technical Writing

Time: 3 Hours **Marks: 60**

Answer Question I and FOUR others. All questions carry equal marks

I. Write short notes on any four of the following

1. JPEG and MPEG
2. FTP
3. Field Reference
4. Usability
5. TIFF and GIFF

II. Explain the various stages involved in the preparation of technical documents.

III. “Technical writing is a team work.” Elucidate.

IV. Explain the different software tools used in Technical writing

V. Elaborate the quality parameters required in preparing documents?

VI. Explain the basic principles of Technical writing

VII. Explain the role of project manager in preparing project documents.

VIII. User manuals are the interfaces between laymen and technology. Substantiate.

Fourth Semester: Elective Course

MCJ 4E 09 : Fashion Communication

Module I

History of Fashion: Recorded History of Fashion, Western and Indian-Fashion with reference to Paris; Origins of Indian Fashion – Jain and Buddhist documents: Sattika – Saree and Cilappathikaram by IlangoAdikal of Classical Tamil Literature -Indulgence of men on beautification-New philosophies emerge after French Revolutions-A emergence of 'bourgeoisies'or middle class-Russian Revolution.

Module II

Factors Influencing Fashion: Industrial Revolution as a key driver-World Wars influence on general lifestyle-Women's entry into factory floors-Emergence of a new and more promising market: Earning Women-The birth of Designers and 'Haute Couture'-Fashion is dictated by Designers-Famous Designers and Design Houses; Eastern and Western Fashion concepts.

Module III

Designers:Charles Frederick Worth. Paul Poiret .Gabrielle Coco Chanel.Jean Patou. Madeleine Vionnet.Elsa Schiaparelli .Christian Dior .Cristobal Balenciaga .Pierre Cardin .Mary Quant. Yves Saint Laurent. Calvin Klein .Ralph Lauren .Giorgio Armani. Claude Montana .Moschino.Guccio Gucci. Issey Miyake. Kenzo.ReiKawakubo. Hanae Mori. Donna Karan. Christian Lacroix. Paloma Piccaso. Bijan.Alexander Mc Queen. Stella McCarteny. Karl Lagerfeld .John Galliano. Jean Paul Gaultier. Hussein Challayan. YohjiYamamato .Bennetton .Dolce &Gabbana .Prada .Louis Vuitton.

David Abraham .ShahabDurazi .SabyasachiMukherjee .J JVallaya .RituBeri.Ritu Kumar .Manish Arora .AnamikaKhanna .Manish Malhotra .Sandeep Khosla .RaghavendraRathore.RohitBal .Rajesh Pratap Singh. Wendell Rodrigues .SatyaPaul .SuneetVerma .TarunTahliani

Module IV

Costumes as a communicative media in films/ Case Studies :

International:

1) Last Emperor – Transition from royal life to a commoner through invasion and revolution

2) Gladiator – Old Roman constumes (dramatized)
3) The Kid – European costumes of 20's and 30's
4) Gandhi – Swadeshi costumes during British Raj
5) Titanic – Post industrial British and American costumes showing the devised of classes

Indian:

1) Devadas – Dramatised classical story
2) AngadiTheru – Costumes on fantasy of lower society
3) 3 Idiots – Representation of people with different characters
4) Celluloid – The transition from old cinema to new
5) Kodiyettam – Picturisation of modern indian civilisation

Module V

Fashion Trends Forecasting – Reading and Reporting : the role of journals, magazines and other media in forecasting-Studying market conditions-Noting the lifestyles of the customers-Feedback from customers-Past data analysis-Observing "street fashion" & what celebrities are wearing-Keeping up with current events, media, arts & the mood of the public Surveying Fashion publications, catalogs, magazines &fashion websites - Evaluating popular designer collections.

Books for reference:

1) Understanding Media – Marshall Mc Luhan
2) Television – Raymond Williams
3) Language of Fashion – Roland Barthes
4) Fashion In FictionText And Clothing In Literature, Film And Television – Peter McNeil
5) Fashion and Music – Janice Miller
6) Advertising in the Fashion Industry – Anna Robbins
7) Objectified (Movie) – Gary Hustwit
8) Introducing Culture Studies – ZiauddinSardar (third edition)
9) Fashion Forecasting - Evelyn L. Brannon
10) The Next Big Thing:Spotting and forecastingconsumer trends for profit,William Higham,
11) Cloth and Colonialism-BernardCohn.
12) Ancient &MedievalIndianCostumes-RoshanAlkazi

13) CostumeDesign 101:The Businessand Art ofCreatingCostumes forFilm andTelevision - Richard La Motte.

Further reading :

1) Ways of Seeing – John Berger
2) Introducing Semiotics – Paul Cobley
3) Lateral Thinking – Edward De Bono
4) CostumeDesign-Barbara andCletusAnderson
5) ClassicalIndianTheatre-AyyappaPannicker.
6) Natyasastra- P.S.R. AppaRao

I. Continuous Assessment: 15 marks

1. Class Tests : 6 marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module five.

2. Attendance : 4 marks

3. Seminar : 2.5 marks

4. Assignment : 2.5 marks

II. End Semester Examination: 60 marks

Model Question Paper
MCJ Degree Examination

MCJ 4E 09: Fashion Communication

Time: 3 Hours **Max Marks : 60**

1) Discuss briefly any four of the following in 50 to 150 words each.

(4x 5 = 20)

i) Fashion Seasons

ii) Ramp Shows and Sale Shows

iii) Haute Couture

iv) Visual Merchanding

v) Sari

2) **Write short notes on any four of the following** (4x10 = 40)

i) Difference between Indian and International fashion consumption

ii) Paris as a Fashion Capital

iii) Any Indian movie and its costume design

iv) Contributions of World War II to the emergence of Fashion Design

v) Any three Indian Fashion Designers and their signature styles.

Fourth Semester: Elective Course

MCJ 4E 10 : Sports Journalism

Module I

History of organized sports and sports journalism with special emphasis on India - ancient and modern sports, Olympics, cricket, tennis, hockey, football, volleyball and athletics; sports journalism as a specialized field of activity in India. Its fledgling days, its growth with the Asian Games in 1951, the jump with India’s Prudential Cup victory, and the future

Module II

Rules and regulations of major sports events; sports statistics; sports institutions – international, national and local; professional sports academies

Module III

Sports desk operation; qualities of a sports reporter; structure of sports writing - types of sports writing - match reports, interviews, features and profiles; choosing the right subject matter and angle; interviewing skills and techniques; feature styles, intro, middle and end; investigative reports; writing for the tabloid, broadsheet, internet, radio and television

Module IV

Impact of sports on society; ethics and the sports journalist: balance and impartiality; sports and politics; drug abuse and sports; violence in sports; sports as business and entertainment

Module V

Perception of sports in mass media - influence of the new media on print, reporting turning analytical; scripting sports stories for television and radio; preparing reviews, and interviews for television and radio; television and radio sports commentary; live sports reporting

Module VI

Sports columns; ghost writing; sports photography; sub-editing and design; analysis of sports pages of English and Malayalam newspapers; a critique of English and Malayalam sports magazines; analysis of sports channels; popular sports analysis programmes on television

Books for Reference

1. Stanley Woodward, **Sports Page**
2. Brad Schultz, **Sports Media: Reporting, Producing and Planning**
3. Rajan Bala, **The Covers Are Off**
4. Ramachandra Guha, **The States of Indian Cricket**
5. Raymond Boyle, **Sports Journalism: Context and Issues**
6. Boria Majumdar, **Indian Cricket Through the Ages**
7. Contrad Fink, **Sports Writing**
8. R.G. Goel, **Encyclopedia of Sports and Games**
9. Goodwill, **Great Sports Personalities of the World**
10. Ray Stubbs, **Sports Book**
11. Garry Whannel, **Media Sports Stars**

I.Continuous Assessment: 15 Marks

1. Class Tests : 6 Marks

There shall be two internal examinations within the semester: one, at the completion of module three and the second, at the completion of module six.

2. Attendance : 4 Marks

Allotment of marks as per University regulations

3. Seminar : 2.5 Marks

4. Assignments : 2.5 Marks

II. End Semester Examination: 60 Marks

Model Question Paper
MCJ Degree Examination

MCJ 4E 10: Sports Journalism

Time: 3 Hours **Max. Marks: 60**

Answer question I and FOUR others. All questions carry equal marks

I. Write short notes on any four of the following.

1. Curtain-raiser
2. Neo Sports
3. Color Pieces
4. Ghost writing
5. Underlay
6. Upsound

II. Write a review of a Malayalam sports magazine.

III. Prepare a profile of Sania Mirza.

IV. Critically analyze the sports pages of two English newspapers.

V. "Indian media is obsessed with cricket." Comment.

VI. How is radio commentary different from television?

VII. Discuss the challenges faced by print and broadcast sports journalists in the context of the new media environment.VIII. Examine the impact on sports journalism with the ongoing commercialization of the sports industry and media corporations.

KANNUR UNIVERSITY

(Abstract)

B.A English Programme- Scheme of Core & Generic Elective Courses of the Programme and Syllabus and Pattern of Question Paper of the Ist Semester of B.A English (Language and Literature) under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated Colleges with effect from **2019 Admission**- Implemented- Orders issued.

ACADEMIC BRANCH

No.Acad.C3/13219/2019 Dated: Civil Station P.O .26.06.2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
4. The Minutes of the Meeting of the Board of Studies in English (UG), held on 14.06.2019
5. Scheme and Ist Semester Syllabus of B.A English (Language and Literature) Programme, Submitted by the Chairperson, Board of Studies in English (UG), dated: 22.06.2019

ORDER

1.A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG Programmes in Affiliated Colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision Processes such as conducting the meeting of various Boards of Studies, Workshops, & discussions.

3. The Revised Regulation for UG Programmes in Affiliated Colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. As per paper read (4) above, the Board of Studies in English (UG) finalized the Scheme of Core, & Generic Elective Courses ,Syllabus and Pattern of Question Papers of B.A English (Language and Literature) Programme, to be implemented with effect from 2019 Admission.

5. Subsequently, as per paper read (5) above, the Chairperson, Board of Studies in English (UG) , submitted the finalized copy of the Scheme of Core & Generic Elective Course and Syllabus and Pattern of Question Paper of the Ist Semester of B.A English (Language and Literature) Programme, for implementation with effect from 2019 Admission.

6. The Vice Chancellor, after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with, accorded sanction to implement the Scheme of Core & Generic Elective Courses and Syllabus and Pattern of Question Papers of the Ist Semester of B.A English (Language and Literature) Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated Colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme of Core & Generic Elective Courses and Syllabus and Pattern of Question Paper of the Ist Semester of B.A English (Language and Literature) Programme, are uploaded in the University Website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering B.A English Programme

Copy to:- 1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in English (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I/ARII (Academic)
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

For more details log on to www.kannuruniversity.ac.in

KANNUR UNIVERSITY

BOARD OF STUDIES IN ENGLISH (U.G.)

SYLLABUS OF CORE COURSES OF B.A ENGLISH LANGUAGE AND LITERATURE PROGRAMME
AND
GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the ManandavadyTaluk of Wayanad Revenue District.

Mission:

- To produce anddisseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

Kannur University

Programme Outcomes (PO)

PO 1.Critical Thinking:

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

Programme Specific Outcomes for BA in English Language and Literature

PSO 1.Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

KANNUR UNIVERSITY

B.A ENGLISH PROGRAMME PROGRAMME

COURSE AND CREDIT DISTRIBUTION STATEMENT

Courses	**No of Courses**		**Credit**	
English Common Course (ECC)		6		22
Additional Common Course (ACC)		4		16
Core Course	15	16	60	64
Discipline Elective Core Course (DSEC)	1		4	
Complimentary Elective Course (CEC)		4		16
Generic Elective Course (GEC)		2		2
Total		**32**		**120**

KANNUR UNIVERSITY

B.A ENGLISH PROGRAMME PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title	Credits	Hours per week	Marks		
				CE	ESE	TOTAL
I	English Common Course–I	4	5	10	40	50
	English Common Course-II	3	4	10	40	50
	Additional Common Course-I	4	4	10	40	50
	Complementary Elective Course-1	4	6	10	40	50
	Core Course-I- Malayalam Literature in English Translation	5	6	10	40	50
II	English Common Course-III	4	5	10	40	50
	English Common Course-IV	3	4	10	40	50

	Additional Common Course-II	4	4	10	40	50
	Complementary Elective Course-II	4	6	10	40	50
	Core Course-II- Academic Writing, Methodology and Research Project	5	6	10	40	50
III	English Common Course-IV	4	5	10	40	50
	Additional Common Course-III	4	5	10	40	50
	Complementary Elective Course-III	4	6	10	40	50
	Core Course III- Old English to Medieval English Literature (500-1500)	3	4	10	40	50
	Core Course-IV- Renaissance and Restoration Literatures (1485-1780)	4	5	10	40	50
IV	English Common Course VI	4	5	10	40	50
	Additional Common Course-IV	4	5	10	40	50
	Complementary Elective Course-IV	4	6	10	40	50
	Core Course-V- The Romantic Period (1780-1832)	4	5	10	40	50
	Core Course VI- The Victorian Period (1832-1901)	3	4	10	40	50
V	Core Course VII- The Early Twentieth Century ((1901-1939)	4	6	10	40	50
	Core Course VIII- The Late Twentieth and Twenty-First Centuries(1939-2018)	5	6	10	40	50
	Core Course IX- Post colonial Literatures in English	5	6	10	40	50
	Core Course X- Linguistics	4	5	10	40	50

	Core Course XI- Project	2	1	5	20	25
	Generic Elective Course	2	2	5	20	25
VI	Core Course XII - Critical Theory	5	6	10	40	50
	Core Course XIII- Women's Writing	4	5	10	40	50
	Core Course XIV- Indian Writing in English	3	4	10	40	50
	Core Course XV- Film Studies	4	5	10	40	50
	Core Course XVI- Discipline Specific Elective	4	4	10	40	50
TOTAL		**120**	**150**	**-**	**-**	**1500**

TOTAL CREDIT (Sum of total credits of all semester): 120

TOTAL MARKS (Sum of total marks of all semester): 1500

(2019 ADMISSION ONWARDS)

Core Courses in English Language and Literature
Programme Specific Outcomes for BA in English Language and Literature

PSO 1.Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of "English Literature" to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women's Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

B.A. ENGLISH LANGUAGE AND LITERATURE--CORE COURSES
WORK AND CREDIT DISTRIBUTION
PART -1 (CORE COURSES)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1B01ENG	Malayalam Literature in English Translation	I	6	5	3
2B02ENG	Academic Writing, Methodology and Research Project	II	6	5	3
3B03ENG	Old English to Medieval English Literature (500-1500)	III	4	3	3
3B04ENG	Renaissance and Restoration Literatures (1485-1780)	III	5	4	3
4B05ENG	The Romantic Period (1780-1832)	IV	5	4	3
4B06ENG	The Victorian Period (1832-1901)	IV	4	3	3
5B07ENG	The Early Twentieth Century ((1901-1939)	V	6	4	3
5B08ENG	The Late Twentieth and Twenty-First Centuries(1939-2018)	V	6	5	3
5B09ENG	Postcolonial Literatures in English	V	6	5	3
5B10ENG	Linguistics	V	5	4	3
6B11ENG	Project	VI	1	2	--
6B12ENG	Critical Theory	VI	6	5	3
6B13ENG	Women’s Writing	VI	5	4	3
6B14ENG	Indian Writing in English	VI	4	3	3
6B15ENG	Film Studies	VI	5	4	3
6B16ENG	Discipline Specific Elective	VI	4	4	3
TOTAL			-	**64**	

EVALUATION

ASSESSMENT	**WEIGHTAGE**	**MARKS(EXCEPT** 6B11ENG & GEC)
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	**WEIGHTAGE**	**MARKS**
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

Course Outcomes and Content Specifications for Core Courses

CORE COURSE 1. Malayalam Literature in English Translation

Course Code	Course Title	Semester	Credit	Hours
1B01 ENG	Malayalam Literature in English Translation	I	5	6

Course Outcomes

CO 1: Understand the word ‘literature’ and ‘literary’ in a broad and inclusive perspective by reading select literary pieces and by applying critical reading strategies.
CO 2: Recognise and describe literary genres and its subclasses.
CO 3: Describe with examples select literary terms and concepts.
CO 4: Understand the basic issues related to translation and in that process develop a sensibility for native and local literatures.
CO 5: Use English to translate and describe everyday activities, regional themes and personal narratives by reading Malayalam literature in translation.
CO 5: Learn to read, enjoy, analyse and critically engage with select literary pieces on their own with minimum guidance.

Content Specifications

Module 01 (2Hrs/Week)

9. Unit 1 (Classroom Teaching)
   What is Literature? by SwapnaGopinath
10. Unit 2 (Classroom Teaching)
   “In the Flood” by ThakazhiSivasankaraPillai
11. Unit 3 (Self Study)
   “Mother” by Vaikom Muhammad Basheer
12. Unit 4 (Classroom Teaching)
   “The Girl who spreads light” by T. Padmanabhan
13. Unit 5 (Self Study)
   “Puranavam” by Chandramathi
14. Unit 6 (Classroom Teaching)
   “Bhagavatha” by Vijayalakshmi
15. Unit 7 (Self Study)
   “Writing” by AnithaThampi
16. Unit 8 (Classroom Teaching)
   “The Last Leaf” by Veeran Kutty
17. Unit 9 (Self Study)
   “Write, Write, Write, Write” by P Raman

Module 02 (2 Hrs/Week)

18. Unit 10 (Classroom Teaching)
    Approaches to Literature by Sreerag P. K.

19. Unit 11 (Classroom Teaching)
    “After the Hanging” by O V Vijayan
20. Unit 12 (Self Study)
    “The Scent of a Bird” by Madhavikkutty
21. Unit 13 (Classroom Teaching)
    “Madness” by C.Ayyappan
22. Unit 14 (Self Study)
    “Cucumber Town” by N Prabhakaran
23. Unit 15 (Classroom Teaching)
    “Right in Front of Our Eyes” by P.P.Ramachandran
24. Unit 16 (Self Study)
    “After the War” by Sachidanandan
25. Unit 17 (Classroom Teaching)
    “Antony Terrikan” by P N Gopikrishnan
26. Unit 18 (Self Study)
    “Lion Hunters” by D. Vinayachandran

Module 03 (2 Hrs/Week)

27. Unit 19 (Classroom Teaching)
    Translations: Crossing Borders by E.V. Fathima
28. Unit 20 (Classroom Teaching)
    “Amphibious Life” by SanthoshEchikkanam
29. Unit 21 (Self Study)
    “Scooter” by Sarah Joseph
30. Unit 21 (Classroom Teaching)Sreehari
    “My Sister’s Bible” by S Joseph
31. Unit 22 (Self Study)Sreehari
    “Etc. by M R Renukumar
32. Unit 23 (Classroom Teaching)
    “The Enchantress of Fried Fish” by Paul Zacharia
33. Unit 24 (Self Study)
    “The Days of Honour and Humiliation” by NithyaChaithanyaYathi

Prescribed Textbook: *Crossing the Borders: Malayalam Literature in English Translation* published by Saradhi Publishers

Model Question Paper

Malayalam Literature in English Translation 1B01 ENG

Duration : 3hrs Max. Marks: 40

Section -A

I. Answer any **seven** in a sentence or two:

1. How does the dog prevent the thief from breaking into the hut through the rooftop crack?

2. How does a student benefit from the study of literature?

3. Why does the leaf wait with a "mischievous" smile for the ant's mother?

4. How did Kuttihassan greet Vellayi-appan?

5. What did Terikkan become in his life?

6. Name some of the ways of approaching a literary work?

7. Where did the train come to a stop after derailment?

8. How did the snake survive in the well without eating the frog?

9. Why is the SSLC Book kept in the Bible?

10. How does Rabassa defend the charges against translations? (7x1=7 marks)

II. Answer any **three** in about 80 words each:

11. What was the real reason behind the demand of Indian labourers to South Africa?
12. Bring out instances from the story "Madness", where Krishnankutty's subservience to his wife becomes evident.
13. How do the animals respond to the presence of the train in their midst?
14. What were the reasons behind the narrator's decision to commit suicide in "The Girl who spreads light?"
15. What constitutes the mighty *Bhagavatha* "that will end only when my life ends?" How is it different from the other *Bhagavatha* mentioned in the poem?

16. How did the frog win the battle of life and death? (3x3=9 marks)

III. Answer any **one** in about 200 words:

17. How does Zachariah succeed in exploring the colonial history of South Africa?
18. Consider the story "In the Flood "as a fable that throws light on how human beings behave when there is a natural disaster.
19. Examine how the wife and daughter of Krishnankutty manifest the contrast between tradition and modernity. (1x8=8 marks)

Section B

IV. Answer any **two** in 80 words each:

20.Comment on the title "The Scent of a Bird"

21. Influence of Gandhian thoughts in "Mother"
22. What do the poets convey about 'art' in "Lion Hunters" and "Writing."
23. Narrate Yati's experience of student life in your words.
24. Reflection of nuclear family in "Scooter" (2x4=8 marks)

Section C

V. Read the passage given below and answer the following questions:

A sanctuary may be defined as a place where Man is passive and the rest of Nature active. Till quite recently Nature had her own sanctuaries, where man either did not go at all or only as a tool-using animal in comparatively small numbers. But now, in this machinery age, there is no place left where man cannot go with overwhelming forces at his command. He can strangle to death all the nobler wild life in the world to-day. Tomorrow he certainly will have done so, unless he exercises due foresight and self-control in the mean time.

There is not the slightest doubt that birds and mammals are now being killed off much faster than they can breed. And it is always the largest and noblest forms of life that suffer most. The whales and elephants, lions and eagles, go. The rats and flies, and all mean parasites, remain. This is inevitable in certain cases. But it is wanton killing off that I am speaking of tonight. Civilized man begins by destroying the very forms of wild life he learns to appreciate most when he becomes still more civilized. The obvious remedy is to begin conservation at an earlier stage, when it is easier and better in every way, by enforcing laws for close seasons, game preserves, the selective protection of certain species, and sanctuaries.

I have just defined a sanctuary as a place where man is passive and the rest of Nature active. But this general definition is too absolute for any special case. The mere fact that man has to protect a sanctuary does away with his purely passive attitude. Then, he can be beneficially active by destroying pests and parasites, like bot-flies or mosquitoes, and by finding antidotes for diseases like the epidemic which periodically kills off the rabbits and thus starves many of the carnivores to death. But, except in cases where experiment has proved his intervention to be beneficial, the less he upsets the balance of Nature the better, even when he tries to be an earthly Providence.

Part -I

1. What is the definition of a sanctuary according to the speaker?
2. Which group of creatures suffer most due to human atrocities?
3. What is the obvious remedy to the problem according to the speaker?
4. How can Man be beneficially active?
5. Choose the word from the passage which means ‘that which cannot be avoided’.

(5x1=5 marks)

Part - II

VI. Based on the passage given above answer any **one** of the following question in 80 words.

6. How does the author ironically contradict his/her own definition of sanctuary in the passage?

7. The narrator is purposefully using the pronoun ‘he’ to refer to human beings. Elucidate

8. Comment on the tone of the author as expressed in the passage.

(1x3=3marks)

Malayalam Literature in English Translation 1B01 ENG

Pattern of Question Paper

SECTION –A (Classroom Study)

I. Seven out of ten short answer questions from Classroom Study section in all modules (7x1=7)

II. Three out of six paragraph questions from Classroom Study section in all modules (3x3= 9)

III. One out of three essay questions from Classroom Study section in all modules (1x8=8)

SECTION B (Guided Self-Study)

IV. Two out of five paragraph questions from **Guided Self-Study** section of all modules (2x4=8)

SECTION C (Comprehension Passage)

V. Part –I

Five out of five short answer/ one word type questions based on the passage. (1x5=5)

Part – II

One out of three paragraph questions of analytical nature based on the passage. (1x3=3)

2. Academic Writing, Methodology and Research Project

Course Code	Course Title	Semester	Credit	Hours
2B02ENG	Academic Writing, Methodology and Research Project	II	5	6

Course Outcomes

- ▣ 1. Understand and apply the nuances of academic writing.
- ▣ 2. Understand the various methodological as well as epistemological aspects of literary studies.
- ▣ 3. Familiarise with the approaches to literature.
- ▣ 4. Choose a tentative topic for the research project to be submitted in semester six.

Content Specifications

Academic Documentation, MLA Style sheet, Citations and Acknowledgements, Format of an Academic Paper, Choosing a Topic, Paratextual Formalities, Ontological and Epistemological Aspects of Research, Methodology, Approaches to Literature, Schools of Theory, Logical Fallacies, Scientific Method.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

3. Old English to Medieval English Literature (500-1500)

Course Code	Course Title	Semester	Credit	Hour
3B03ENG	Old English to Medieval English Literature (500-1500)	III	3	4

Course Outcomes

- ▣ 1. Have an understanding of the contexts which produced Old English literature.
- ▣ 2. Read translation extracts from key texts of the Old English period
- ▣ 3. Understand the key aspects of Old English language.
- ▣ 4. Understand the key genres, authors, texts, styles and themes of the Medieval English Period.
- ▣ 5. Read excerpts from the variety of writings produced during this period.
- ▣ 6. Understand the key aspects of Medieval English dialects.

Content Specifications

Historical Overview: Roman Occupation, Anglo-Saxon Conquest, Kingship, Feudalism, The Church,
Literary Overview: Language, Epic and Romance, The Rise of Theatre, The Church and Literature, Wealth and Wages, Men Writing about Women, Excerpts from Select Texts.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

4. Renaissance and Restoration Literatures (1485-1780)

Course Code	Course Title	Semester	Credit	Hour
3B04ENG	Renaissance and Restoration Literatures (1485-1780)	III	4	5

Course Outcomes

- ▣ 1. Define Renaissance literature/ Problems of definition
- ▣ 2. Trace the relationship between political economy, cultural history and production of arts and literature during the early modern period
- ▣ 3. Read specimens of major works belonging to the Renaissance period.
- ▣ 4. Understand the problematics of "modernisation" of Britain including the development of political parties and parliamentary democracy through the cultural productions of Restoration period
- ▣ 5. Identify literary narratives that deal with slave trade and colonial aspirations.
- ▣ 6. Understand the development of literary criticism as a meta-narrative to literature.
- ▣ 7. Read specimens of major works belonging to the Restoration period.

Content Specifications

Historical Overview: (Renaissance) Tudor Sovereignty, 1485-1603- The Early Stuarts and the Interregnum-The British Nations-Culture and Society of the Renaissance- Politics, Power and Ideologies, Belief and Thought.
(Restoration): The Monarchy, 1660-1745, Restoration- The Exclusion Crisis- James II- The Glorious Revolution- Succession Crises- The South Sea Bubble- The Last Jacobite Rebellion-Agriculture- London's Restorations- Urbanisation- Consumer Culture- Education- Marriage-Greenwich and Political Geography- Evangelism and Methodism.

Literary Overview: (Renaissance) Literacy and Education, Continuities, Innovations and Influences, Intellectual Influences, Writing, Production, Consumption and the Marketplace, Language- Forms, Genres, Styles- Authors, Texts, Subjects-Texts and Political Structures-Gender Roles and Relations- Love and Sexuality- Nationhood, Race, Colonialism and Empire-Excerpts from Select Texts of the Renaissance Period.
(Restoration): Literature and Letters- Restoration Poetry- Restoration Drama- The Origin of the Novel- Beginnings of Literary Criticism- The Enlightenment- The Royal Society and Institutions of Modern Science- Select Texts of the Restoration Period.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

5. The Romantic Period (1780-1832)

Course Code	Course Title	Semester	Credit	Hour
4B05ENG	The Romantic Period (1780-1832)	IV	4	5

Course Outcomes

- 1. Understand the cultural history of the period and recognise the features of literary romanticism
- 2. Trace the relationship between political economy, cultural history and production of arts and literature with reference to the romantic period
- 3. Read specimens of major works belonging to the period.

Content Specifications

Historical Overview: Culture and Society**-** The Industrial Revolution- Belief and Thought Systems- Politics, Power and Ideologies- The Slave Trade and Abolitionism-
Literary Overview: Influence of Industrial Revolution- Modes of Production and Consumption- The Literary Marketplace- The Periodicals- Authors, Texts and Subjects- Women Romantic Poets- Labouring Poets- The Romantic Novel- Romantic Drama- Class, Power and Politics- Land and Landscape- The Sublime and the Beautiful- Science- Gender and Sexuality- Nationhood, Empire and the Orient- Slavery- Select Texts of the Romantic Period.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

6. The Victorian Period (1832-1901)

Course Code	Course Title	Semester	Credit	Hour
4B06ENG	The Victorian Period (1832-1901)	IV	3	4

Course Outcomes

- 1. Understand a range of Victorian literature in relation to a range of contexts including Victorian anxieties about modernity, madness, sexual transgression and disease.
- 2. Analyze the work of a range of Victorian writers, both canonical and less well-known, and with a range of genres including the novel, short story and poetry.
- 3. Identify and discuss theoretical discourses concerning class, sexuality, gender and colonialism as these illuminate a range of Victorian texts.
- 4. Understand and successfully deploy a range of terms and concepts integral to Victorian literature.

Content Specifications

Historical Overview: Social and Political Transformations- Queen Victoria- Government, the Reform Acts, and the Beginnings of Mass Democracy- Benjamin Disraeli- Legislative Innovations and Social Reform- Religion- Science, Technology and Innovation- The Great Exhibition- Technological Travel, Commerce and the British Empire- Printing-
Literary Overview: Major Influences- Socio-political Background- Modes of Production and Consumption- The Literary Marketplace- Language and Forms- Genres and Styles- The Victorian Novel- Victorian Poetry- Pre-Raphaelites- Victorian Drama- Essays- Class Relations and Conflict- The Colonial Situation- Cityscapes- Victorian Ruralism- Science and Nature- The Crises of Faith- Gender Roles and Relations- Select Texts of the Victorian Period.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

7. The Early Twentieth Century ((1901-1939)

Course Code	Course Title	Semester	Credit	Hour
5B07ENG	The Early Twentieth Century ((1901-1939)	V	4	6

Course Outcomes

- ▣ 1. Understand the cultural, political, and stylistic protocols of modernism and its various literary movements.
- ▣ 2. Trace the relationship between political economy, cultural history and production of arts and literature
- ▣ 3. Read specimens of major works belonging to the period.

Content Specifications

Historical Overview: Georgian Era- Discords within the Nation- Liberal Reform and the Rise of the Labour- Irish Home Rule- The First World War- Britain between the Wars- Politics, Economy and Social Change-

Literary Overview: Modernism- Modes of Production and Consumption- Forms, Genres and Styles of the Period- The First World War and Literature- Women in Society- Feminism and the Suffrage Movement- Psychology and Perception- Cubism- Select Texts of the Period.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

8. The Late Twentieth and Twenty-First Centuries (1939-2015)

Course Code	Course Title	Semester	Credit	Hour
5B08ENG	The Late Twentieth and Twenty-First Centuries(1939-2018)	V	5	6

Course Outcomes

- ▣ 1. Understand the cultural, political, and stylistic protocols of post-modernism and the various literary movements
- ▣ 2. Understand and apply the basics of the various reading strategies that emerged during the period
- ▣ 3. Read specimens of major works belonging to the period.

Content Specifications

Historical Overview: Post-War Britain-Social, Political and Economic Change**-**The Welfare State- Culture and Identity- Belief and Thought-
Literary Overview: Literature and the Second World War- Realism, Modernism, Post-Modernism- The Twenty-First Century Novel- Post-Colonial English Writing- Modes of Production and Consumption during the Period- English Language- Post-Modern Fiction-Political Drama- Poetry and Diversity- Environmental Concerns- Class, Culture and Society-Gender and Sexuality- Empire, Race and National Identity- Select Texts of the Period.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

9. Postcolonial Literatures in English

Course Code	Course Title	Semester	Credit	Hour
5B09ENG	Postcolonial Literatures in English	V	5	6

Course Outcomes

- ▣ 1. Understand the meaning, scope and issues related to the term postcolonial.
- ▣ 2. Read specimens of major works belonging to the genre.
- ▣ 3. Familiarise with the cardinal concepts of postcolonial theory.

Content Specifications

Historical Overview: The British Empire- Orientalism- Motifs of the Empire- Maritime Power- Multiple Empires- The Scramble for Africa- Decolonisation- Neo-Colonialism-
Literary Overview: Defining Postcolonial Literature- Types of Colonies- Local Cultures- Modernism, Christianity and the Bible- Writing Back- Canon- Select Texts from Postcolonial Writings.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

10. Linguistics

Course Code	Course Title	Semester	Credit	Hour
5B10ENG	Linguistics	V	4	5

Course Outcomes

▣ 1. Learn the theories regarding origin, development and history of languages.
▣ 2. Familiarise with the cardinal concepts related to “linguistics”.
▣ 3. Understand the modern directions in linguistic studies.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

11. Project

Course Code	Course Title	Semester	Credit	Hour
6B11ENG	Project	VI	2	1

Course Outcomes

▣ 1. Learn and apply specific documentation styles and methodological formalities.
▣ 2. Critically engage with a literary theme or topic.
▣ 3. Understand the basic formalities regarding research in humanities.

EVALUATION

ASSESSMENT	**WEIGHTAGE**	**MARKS**
EXTERNAL	75%	20
INTERNAL	25%	5

12. Critical Theory

Course Code	Course Title	Semester	Credit	Hour
6B12ENG	Critical Theory	VI	5	6

Course Outcomes

- ▣ 1. Understand the basics of various theoretical positions in literary and culture studies.
- ▣ 2. Apply specific theoretical insights into the study of specific works of art as well as cultural articulations.
- ▣ 3. Understand the ideological assumptions underlying common-sense notions and canon formation.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

13. Women’s Writing

Course Code	Course Title	Semester	Credit	Hour
6B13ENG	Women’s Writing	VI	4	5

Course Outcomes

- 1. Understand women’s writing as a specific genre.
- 2. Appreciate the variety in women’s literature and the correlation between such variety and specific socio-political contexts.
- 3. Understand the various dialogic positions within women’s writing.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

14. Indian Writing in English

Course Code	Course Title	Semester	Credit	Hour
6B14ENG	Indian Writing in English	VI	3	4

Course Outcomes

- ▣ 1. Understand Indian Writing in English as a specific genre based on certain common socio-political contexts.
- ▣ 2. Understand the various dialogic positions within Indian Writing in English.
- ▣ 3.Understand the regional diversities and thematic plurality of IWE.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

15. Film Studies

Course Code	Course Title	Semester	Credit	Hour

6B15ENG	Film Studies	VI	4	5

Course Outcomes

- ▣ 1. Learn the basic terminology, technical aspects, and the major movements in the history of cinema.
- ▣ 2. Watch select movies and analyse them with an eye on technical, thematic and socio-political aspects.
- ▣ 3. Develop basic knowledge and familiarity with the various trends in Indian cinema.

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

(DISCILPINE SPECIFIC ELECTIVE COURSES)

Sem.	Course Code	Title of the Course	H/W	Credits

6	6B16 ENG-A	World Literature in Translation	4	4
6	6B16 ENG-B	Indian Writing in Translation	4	4
6	6B16 ENG-C	Writing for Media	4	4

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	80 %	40
INTERNAL	20%	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	5
COMPONENT 2 ASSIGNMENT	25%	2.5
COMPONENT 3 SEMINAR /VIVA	25%	2.5

PART– 3 (GENERIC ELECTIVE COURSES IN ENGLISH)

Semester	Course Code	Name of the Course	H/W	Credits	EXAM HRS
5	5D01 ENG	English for Competitive Exams	2	2	2
5	5D02 ENG	Film Studies	2	2	2

5	5D03 ENG	Theatre Studies	2	2	2
5	5D04 ENG	Visual Arts	2	2	2
5	5D05 ENG	Sports Studies	2	2	2
5	5D06 ENG	Regional History	2	2	2
5	5D07 ENG	Philosophy of Science	2	2	2
5	5D08 ENG	Gender Studies	2	2	2

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	75%	20
INTERNAL	25%	5

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS
COMPONENT1 TEST PAPER	50%	2.5
COMPONENT 2 ASSIGNMENT	50%	2.5

TOTAL CREDITS =
60 (Part 1 Core) + **4** (Part 2 Complimentary Elective Courses) + **2** (Part 3 Generic Elective Courses) = **66 Credits**

TOTAL HOURS
= 74 (Part 1 Core) + **4** (Part 2 Complimentary Elective Courses) + **2** (Generic Elective Courses) = **80 Hrs.**

KANNUR UNIVERSITY

(Abstract)

B.Sc. Computer Science Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/12371/2019 Civil Station P.O, Dated 21/06/2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O No.Acad.C2/429/2017 Vol.II dated 03-06-2019
4. The Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 07-06-2019
5. Syllabus of B.Sc. Computer Science submitted by the Chairperson, Board of Studies in Computer Science (UG) dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies, Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Computer Science (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc.Computer Science Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Computer Science (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc Computer Science Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc. Computer Science programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to report before the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.Sc.Computer Science Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
for REGISTRAR

To

The Principals of Colleges offering B.Sc. Computer Science Programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Computer Science (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES-COMPUTER SCIENCE(UG)

SYLLABUS FOR B.SC. COMPUTER SCIENCE CORE, COMPLEMENTARY ELECTIVE COURSE FOR B.SC. MATHEMATICS/STATISTICS/PHYSICS/ ELECTRONICS PROGRAMMES AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM
(OBE-Outcome Based Education System)

(2019 ADMISSION ONWARDS)

Kannur University

Vision and Mission Statement

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manantavadytaluk of Wayanad Revenue District"

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

Programme Outcomes (PO)

PO 1. Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2. Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3. Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Technological innovations have redefined the traditional concepts of education, profession and lifestyles in the contemporary scenario. Computer Systems are a part of every aspect of prevalent culture from home video game consoles to hospital monitoring equipment. Computer scientists design, build and improve these systems, finding new applications for sophisticated technology. India has been one of the leading exporters of IT talent and Indian computer professionals have played major role in the growth and development of IT sector in various countries.

The Board of Studies in Computer Science travails to offer students with a solid technological foundation through the reformed curriculum for undergraduate programme of Kannur University. The curriculum aims at developing technical caliber among students through academic explorations in the classroom, extended academic activities like seminars, workshops and conferences. Formative and summative assessments will absolutely be in tune with the learning outcomes and the instructional strategies.

In this era of unprecedented technological developments, the Board of Studies in Computer Science of Kannur University substantially emphasizes employment-based curriculum to empower the students with refined technical competence. This curriculum categorically states the graduate attributes / outcomes and has been developed after various workshops and academic deliberations with different stakeholders at various levels. The Board of Studies in Computer Science has resolved to introduce the syllabus for UG Programme in the affiliated colleges from 2019 admission onwards and I would like to place on record my gratefulness to the members of the Board of Studies, faculty and stakeholders for having helped me in the formulation of this syllabus.

Lt. Thomas Scaria

Chairperson

Board of Studies, Computer Science (UG)
Kannur University

KANNUR UNIVERSITY

Programme Specific Outcome of B.Sc. Computer Science Programme

PSO1	Understand the concepts of Computer Science and Applications.
PSO2	Understand the concepts of System Software and Application Software.
PSO3	Understand the concepts of Algorithms and Programming.
PSO4	Understand the concepts of Computer Networks and Operating Systems
PSO5	Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering.

KANNUR UNIVERSITY

BSC COMPUTER SCIENCE PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common Course – English I	4	5	18	25
	Common Course – English II	3	4		
	Common Course – Additional Language I	4	5		
	Core Course I – 1B01CSC Introduction to C Programming	2	1		
	Core Course III – 2B03CSC Lab 1: C Programming*	0	2		
	Complementary Elective I (Mathematics /Statistics)	3	4		
	Complementary Elective II (Physics)	2	2		
	Complementary Elective II (Physics- Practical)	-	2		
II	Common Course – English III	4	5	20	25
	Common Course – English IV	3	4		
	Common Course – Additional Language II	4	5		
	Core Course II – 2B02CSC Advanced C Programming	2	1		
	Core Course III – 2B03CSC Lab 1: C Programming*	2	2		
	Complementary Elective I (Mathematics /Statistics)	3	4		
	Complementary Elective II (Physics)	2	2		
	Complementary Elective II (Physics- Practical)	-	2		
III	General Awareness Course I – 3A11CSC Programming in C++	3	3	15	25
	General Awareness Course II – 3A12CSC Database Management System	3	3		
	Core Course IV – 3B04CSC Data Structures	4	4		
	Core Course VI – 4B06CSC Lab II: Data Structures Using C++**	0	3		
	Core Course VII – 4B07CSC Lab III: Database Management System**	0	2		
	Complementary Elective I (Mathematics /Statistics)	3	5		
	Complementary Elective II (Physics)	2	3		
	Complementary Elective II (Physics- Practical)	-	2		

IV	General Awareness Course III – 4A13CSC Digital Electronics	3	3	24	25
	General Awareness Course IV – 4A14CSC Operating Systems	3	3		
	Core Course V – 4B05CSC Software Engineering	4	4		
	Core Course VI – 4B06CSC Lab II: Data Structures Using C++**	3	3		
	Core Course VII – 4B07CSC Lab III: Database Management System**	2	2		
	Complementary Elective I (Mathematics /Statistics)	3	5		
	Complementary Elective II (Physics)	2	3		
	Complementary Elective II (Physics- Practical)	4	2		
V	Core Course VIII – 5B08CSC Web Technology	4	4	17	25
	Core Course IX – 5B09CSC Java Programming	4	4		
	Core Course X – 5B10CSC Computation Using Python	3	3		
	Core Course XI – 5B11CSC- Discipline Specific Elective I	4	4		
	Core Course XVI – 6B16CSC Lab IV: Java Programming***	0	4		
	Core Course XVII – 6B17CSC Lab V: Web Technology and Python Programming***	0	4		
	General Elective Course	2	2		
VI	Core Course XII – 6B12CSC Computer Networks	4	4	26	25
	Core Course XIII – 6B13CSC Compiler Design	4	4		
	Core Course XIV – 6B14CSC Computer Organization	3	3		
	Core Course XV – 6B15CSC- Discipline Specific Elective II	4	4		
	Core Course XVI – 6B16CSC Lab IV: Java Programming***	3	2		
	Core Course XVII – 6B17CSC Lab V: Web Technology and Python Programming***	3	2		
	Core Course XVIII – 6B18CSC Project	5	6		
Total				120	150

Total Marks of the Programme – 1750 Marks (Eng-200 Marks, Additional Common Course 100 Marks, Core 1050 Marks, First Complementary Elective 200 Marks and Second Complementary Elective -200 Marks)

*External examination will be conducted at the end of second semester

**External examination will be conducted at the end of fourth semester

***External examination will be conducted at the end of sixth semester

First Complementary Elective: Mathematics/Statistics

Second Complementary Elective: Physics

PART A

B.SC. COMPUTER SCIENCE CORE COURSES WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS(INTERNAL + EXTERNAL)
1B01CSC	INTRODUCTION TO C PROGRAMMING	1	1	2	3	10+40
2B03CSC	LAB I: C PROGRAMMING	1	2	0	-	-
2B02CSC	ADVANCED C PROGRAMMING	2	1	2	3	10+40
2B03CSC	LAB I: C PROGRAMMING	2	2	2	3	5+20
3A11CSC	PROGRAMMING IN C++	3	3	3	3	10+40
3A12CSC	DATABASE MANAGEMENT SYSTEM	3	3	3	3	10+40
3B04CSC	DATA STRUCTURES	3	4	4	3	10+40
4B06CSC	LAB II: DATA STRUCTURES USING C++	3	3	0	-	-
4B07CSC	LAB III: DATABASE MANAGEMENT SYSTEM	3	2	0	-	-
4A13CSC	DIGITAL ELECTRONICS	4	3	3	3	10+40
4A14CSC	OPERATING SYSTEMS	4	3	3	3	10+40
4B05CSC	SOFTWARE ENGINEERING	4	4	4	3	10+40
4B06CSC	LAB II: DATA STRUCTURES USING C++	4	3	3	3	5+20
4B07CSC	LAB III: DATABASE MANAGEMENT SYSTEM	4	2	2	3	5+20
5B08CSC	WEB TECHNOLOGY	5	4	4	3	10+40
5B09CSC	JAVA PROGRAMMING	5	4	4	3	10+40
5B10CSC	COMPUTATION USING PYTHON	5	3	3	3	10+40
5B11CSC	DISCIPLINE SPECIFIC ELECTIVE I	5	4	4	3	10+40
5D--CSC	GENERIC ELECTIVE COURSE	5	2	2	2	5+20
6B16CSC	LAB IV: JAVA PROGRAMMING	5	4	0	-	-
6B17CSC	LAB V: WEB TECHNOLOGY& PYTHON PROGRAMMING	5	4	0	-	-
6B12CSC	DATA COMMUNICATION AND COMPUTER NETWORKING	6	4	4	3	10+40

6B13CSC	COMPILER DESIGN	6	4	4	3	10+40
6B14CSC	COMPUTER ORGANIZATION	6	3	3	3	10+40
6B15CSC	DISCIPLINE SPECIFIC ELECTIVE II	6	4	4	3	10+40
6B16CSC	LAB IV: JAVA PROGRAMMING	6	2	3	3	5+20
6B17CSC	LAB V: WEB TECHNOLOGY& PYTHON PROGRAMMING	6	2	3	3	5+20
6B18CSC	PROJECT*	6	6	5	-	20+80
*AN INDUSTRIAL VISIT (STUDY TOUR) IS RECOMMENDED FOR THE PROJECT WORK						

TOTAL MARKS OF CORE COURSES 1050

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B11CSC-A	ALGORITHM DESIGNING	5	4	4	3
5B11CSC-B	LINUX ADMINISTRATION	5	4	4	3
5B11CSC-C	COMPUTER GRAPHICS	5	4	4;	3
6B15CSC-A	INFORMATION SECURITY	6	4	4	3
6B15CSC-B	DATA MINING	6	4	4	3
6B15CSC-C	BIO-INFORMATICS	6	4	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS EVALUATION FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	80%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE MARKS OBTAINED IN THE TESTS CONDUCTED.

COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	20%	ANY ONE COMPONENT

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**Short Answer**	**6 Questions x 1 Mark = 6 Marks**
	Answer all questions	6 Questions x 1 Mark = 6 Marks
Part B	**Short Essay**	**8 Questions x 2 Marks = 16 Marks**
	Answer any 6 questions	6 Questions x 2 Marks = 12 Marks
Part C	**Essay**	**6 Questions x 3 Marks = 18 Marks**
	Answer any 4 questions	4 Questions x 3 Marks = 12 Marks
Part D	**Long Essay**	**4 Questions x 5 Marks = 20 Marks**
	Answer any 2 questions	2 Questions x 5 Marks = 10 Marks
Total Marks Including Choice: 60		
Maximum Marks for the Course: 40		

CONTINUOUS EVALUATION FOR PRACTICAL

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1: LAB SKILLS, OBSERVATION NOTE AND PUNCTUALITY	20% FOR LAB SKILL 20% FOR OBSERVATION NOTE AND PUNCTUALITY	OBSERVATION NOTE IS MANDATORY. MARKS SHOULD BE GIVEN CONSIDERING OBSERVATION NOTE LAB SKILLS AND PUNCTUALITY.
COMPONENT1: TEST	60%	MODEL EXAMINATION SHOULD BE CONDUCTED BEFORE EXTERNAL EXAM AND CONSIDERED FOR INTERNAL MARK

END SEMESTER EVALUATION FOR PRACTICAL

***EXCEPT : 2B03CSC ADVANCED C PROGRAMMING - LAB**

COMPONENT	PART A	PART B
Code Writing	3	3
Output	3	3
Modification for Part A or Part B	3	
Record	2	
Viva	3	
Total Marks	**20**	

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION-PRACTICAL

Part A	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Part B	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Total Marks Including Choice: 40		
Maximum Marks for the Course: 20		

SEMINARS/ASSIGNMENTS/VIVA

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

RECORDS

One rough record (Observation Note) and one fair record are compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works. Record mark is calculated at the time of End Semester Evaluation. Observation notes are compulsory in Lab hours. Students should get signature for each program done in the lab from the faculties and those programs are recommended for fair record.

PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of FIVE credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but, in an instance, where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to THREE.

PROJECT EVALUATION

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. Assessment of different components may be taken as below.

CONTINUOUS EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Punctuality	20%
Relevance of topic System study / Design of tables	20%
Project Report	30%
Presentation & Viva-voce	30%
Total	**100%**

END SEMESTER EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Written Synopsis/Abstract	12.5%
Content of the Project	12.5%
Quality of project work/Use of software/ tools	12.5%
Perfection of the work (Designs of tables/ Input & Output forms)	25%
Live demo	12.5%
Viva-voce	25%
Total	**100%**

CORE COURSE I: 1B01CSC INTRODUCTION TO C PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1	1B01CSC	1	2	3

COURSE OUTCOME

CO1: Aware about basics of programming.
CO2: Capable to analyze the problem and design algorithm and flowchart.
CO3: Familiar the basics of high-level language – C.
CO4: Able to develop efficient and error free programs in C.

Unit I:

Computer Programming and Languages: Introduction, Developing a Program, Program Development Cycle, Algorithm, Flowchart: Flowchart Symbols, Guidelines for Preparing Flowcharts, Benefits of Flowcharts, Limitations of Flowcharts, Examples of Algorithm and Flowchart. [Text Book 1]

(5 Hrs)

Unit II:

Overview of C: History of C, Importance of C, Basic Structure of C Programming Style, Executing a C program, Source Code, Object Code, Executable File, File Extensions, Character Set, C Tokens - Keywords, Identifiers, Constants, Variables, Data Types, Declaration of Variables, Assigning Values to Variables, Reading Data from Keyboard, Operators and Expressions: Arithmetic Operator, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operator, Bitwise Operator, Special Operators,. Arithmetic Expressions, Precedence of Arithmetic Operators, Type Conversion in Expressions.

(5 Hrs)

Unit III:

Managing Input Output Operation: Reading a Character, Writing a Character, Formatted Input, Formatted Output. Decision Making and Branching: Decision Making with if Statement - Simple if, if - else, Nested if - else, else if Ladder, switch Statement, go to Statement, Decision Making and Looping: while, do-while, for Statement, Jumps in Loops - break and continue Statements.

(4 Hrs)

Unit IV:

Arrays: Introduction, One Dimensional Arrays - Declaration of Arrays, Initialization of Arrays; Two-Dimensional Arrays - Initializing Two-Dimensional Arrays, Multi-Dimensional Array, Handling of Character Strings: Introduction, Declaring and Initializing String Variables, Reading a Line of Text, Writing Strings to Screen, Arithmetic Operations on Characters, String Handling functions: strlen, strcpy, strcmp, strcat, strrev.

(4 Hrs)

Books for Study:

1. Introduction to information technology ITL Education solutions Limited, second Edition
2. Programming in ANSI C Second Edition – E Balagurusamy – Tata McGraw-Hill Publishing company Limited

Books for Reference:

1. Let us C, YeshavantKanetkar, 16thEdn, BPB
2. Programming in C, Ashok N Kamthane, Pearson Education
3. Computer Basics and c Programming, V. Rajaraman, PHI, 2008 6
4. Fundamentals of information technology, Dr. S.B Kishor, A.S Khandelwal, 2nd Ed, Published by DAS GANU Prakashan.

Online References:

1. http://www.yspuniversity.ac.in/cic/algorithm-manual.pdf
2. https://www.it.iitb.ac.in/~vijaya/ssrvm/dokuwiki/media/s6_l7_20jan.pdf

Marks Including Choice:

Unit	Marks
I	14
II	14
III	16
IV	16

CORE COURSE II: 2B02CSC ADVANCED C PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
2	2B02CSC	1	2	3

COURSE OUTCOME

CO1: Familiar with advanced concepts of C program.
CO2: Capable to work with user defined as well as library functions.
CO3: Skilled to solve more complex problems.
CO4: Able to develop C programs using structure, union, pointers and files.

Unit I:

User Defined Functions: Need for User-defined Functions, The Form of C Functions – Function Name, Argument List, Return value and Their Types, Calling a Function, Category of Functions – No Argument and No Return Values, Argument but no Return Values, Arguments with Return Values, Handling of Non-integer Functions, Functions Returning Nothing, Nesting of Functions, Recursion, The Scope and Life-time of Variables in a Function, Automatic Variables, External Variables, Static Variables, Register Variables.

(5 Hrs)

Unit II:

Pointers: Introduction; understanding pointers; Accessing the address of a variable; Declaration and initialization of a pointer; Accessing a variable through its pointer; Pointer expressions; Pointer increments and scale factor; Pointers and Arrays; Pointers and Functions – pointers as function arguments, pointers to functions; pointers and structures.

(4 Hrs)

Unit III:

Structures and Unions: Structure Definition; Giving values to members; Structure initialization; Comparison of structure variables; Arrays of Structures; Arrays within Structures; Structures within Structures; Unions; Dynamic Memory Allocation: Memory allocation process; Allocating a block of memory; Allocating multiple blocks of memory; Releasing the used space, Altering the size of a block.

(4 Hrs)

Unit IV:

File Management in C: Introduction; Defining and Opening a File; Closing a file; Input/ output operations on files – the getc and putc functions; getw and putw functions; fprintf and fscanf functions; Error handling during I/O operations; Random Access to Files; Command line arguments; The preprocessor: Macro substitution-simple macro substitution; Macros with arguments; Nesting of macros; Undefining a macro; File inclusion.

(5 Hrs)

Books for Study:

1. Programming in ANSI C Second Edition – E Balagurusamy – Tata McGraw-Hill Publishing company Limited

Books for Reference:

1. Let us C, YeshavantKanetkar, 3rd Edn, BPB
2. Programming in C, Ashok N Kamthane, Pearson Education
3. Programming using C, Dr. S.B Kishor, 2^{nd} Ed, DAS GANU Prakashan.

Marks including choice:

Unit	Marks
I	17
II	13
III	13
IV	17

CORE COURSE III: 2B03CSC ADVANCED C PROGRAMMING - LAB

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
2	2B03CSC	2*	2	3

*Lab will be conducted for 2 hours each in I and II Semesters

Part A

Conditional operator

1. Write a program to print largest among three numbers

sizeof operator

2. Write a program to print the size of built in data types.

else if

3. Write a program to check whether the given number is odd or even
4. Write a program to find the roots of a quadratic equation

else if ladder

5. Write a program to print grade of students
6. Write a program to count number of vowels, consonants and spaces in a line of text.

switch

7. Write a program to accept two numbers and perform various arithmetic operations (+, -, *, /) based on the symbol entered.

while

8. Write a program to check whether the given number is Armstrong number or not.
9. Write a program to print Fibonacci series up to a given number.

do-while

10. Write a program to print multiplication table for the given number

for

11. Write a program to print prime numbers within range.
12. Write a program to convert decimal number to its binary equivalent.

Part B

Array

13. Write a program to perform Matrix multiplication

String

14. Write a program to check whether the given string is palindrome or not
15. Write a program to implement 5 string handling functions

Function

16. Write a program to print transpose of a given matrix

Recursive function

17. Write a program to find the factorial of a given number.
18. Write a program to print sum of n natural numbers

Pointers

19. Write a program to swap two numbers using pointers

Pointers and function

20. Write a program to access the elements of an array using function pointer

Structure

21. Write a program to add two complex numbers using structure
22. Write a program to calculate and display the Gross_salary and Net_salary of employees working in a retail medical shop if their Basic, DA, TA, other allowances and deductions are given.

File

23. Write a program to read a line of text from the keyboard and write it to a file.

Macros

24. Write a program to print volume of a triangle using the concept macros with argument.

DISTRIBUTION OF MARKS FOR END SEMESTER EVALUATION

COMPONENT	PART A	PART B
Code Writing	3	3
Output	3	3
Modification for Part A or Part B	2	
Algorithm/Flowchart for part A or Part B	2	
Record	1	
Viva	3	
Total Marks	**20**	

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Part B	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Total Marks Including Choice: 40		
Maximum Marks for the Course: 20		

GENERAL AWARENESS COURSE I: 3A11CSC PROGRAMMING IN C++

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
3	3A11CSC	3	3	3

COURSE OUTCOME

CO1: Describe the Object-Oriented Paradigm
CO2: Understand dynamic memory management techniques
CO3: Analyze a problem and construct a C++ program that solves it
CO4: Discover errors in a C++ program and describe how to fix them

Unit I:

Procedure oriented programming; Object oriented programming; OOP-Concepts, benefits, applications. What is c++? Applications of c++; Structure of C++ program; How to create and execute a C++ program.Reference variables.Extraction and insertion operator, Scope resolution operator, Memory dereferencing and memory management operator.Inline function default arguments; Constant arguments.

(12Hrs)

Unit II:

Specifying a class; Defining member functions making an outside function inline; nesting of member functions.private member functions. arrays within a class arrays of objects; objects as function arguments; returning objects. memory allocation for objects, static data members; static member functions, function overloading, friend functions; local classes. Constructors; default constructors, Parameterized constructors; multiple constructors in a class, constructors with default arguments; copy constructor; Destructors.

(16Hrs)

Unit III:

Operator overloading; overloading unary operators, overloading binary operators, overloading binary operators using friends; rules for overloading operators. Inheritance - defining derived classes, single inheritance; making a private member inheritance; multilevel inheritance, multiple inheritance; hierarchical inheritance; hybrid inheritance; virtual base classes constructors in derived classes; abstract classes; Nesting of classes;

Pointers-Pointers to objects; this pointer, Pointers to derived classes; virtual functions, pure virtual functions.

(14Hrs)

Unit IV:

C++ streams; stream classes , unformatted I/O operations; formatted console I/O operations; Managing output with manipulators. Files – classes for file stream operation and their manipulations. Sequential input and output operation updating a file: random access, error handling during file operations.

(12Hrs)

Books for Study:

1. Object Oriented Programming with C++; E. Balagurusamy; 3rd Edn; TMH 2006.

Books for Reference:

1. K R Venugopal, RajkumarBuyya, "Mastering C++", Tata McGraw Hill, 2013.
2. Object Oriented Programming with ANSI & Turbo C++, Ashok N. Kamthane, Pearson Education
3. Programming in C++, M.T. Somashekara, Prentice Hall of India, New Delhi
4. Let us C++, YeshawantKanetkar, BPB

Marks including choice:

Unit	Marks
I	12
II	18
III	18
IV	12

GENERAL AWARENESS COURSE II: 3A12CSC DATABASE MANAGEMENT SYSTEM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
3	3A12CSC	3	3	3

COURSE OUTCOME

CO1: Familiar with organized data collection.
CO2: Able to design data bases.
CO3: Skilled to normalize the data bases.
CO4: Capable to frame queries for various purposes

Unit I:

Introduction – purpose of Database systems. View of Data, Data Models, transaction management, database structure, DBA, Data Base Users.

(10 Hrs)

Unit II:

E-R model, Basic concepts; design issues; Mapping Constraints; Keys; Primary, Foreign, candidate, E-R diagram; Weak entity set; Extended E-R features. Normal forms – 1NF, 2NF, 3NF and BCNF; functional dependency, Normalization.

(15 Hrs)

Unit III:

SQL: database languages; DDL- create, alter, drop; DML- Insert , Select, update, Delete; DCL ,TCL,SQL Functions, Data types in SQL; Creation and deletion of database and user .Developing queries and sub queries; Join operations in Detail .

(15 Hrs)

Unit IV:

Integrity constraints, views, Trigger and Sequences, Relational model – Structure of Relational database. Relational Algebra; Fundamental operations; Relational calculus; Tuple and domain calculus.

(14 Hrs)

Books for Study:

1. Database System Concepts; Silberschatz, Korth and Sudarsan, 5th Edn; McGraw Hill.
2. The Database Book: Principles and Practice Using MySQL; Gehani; University Press.

Books for Reference:

1. Fundamentals of Database systems, E. Navathe, 7thedn, Pearson Education.
2. Introduction to data base systems ITL Education Solutions Limited
3. DBMS and ORACLE, Dr. S.B Kishor, 2nd Ed, DAS GANU Prakashan.

Marks including choice:

Unit	**Marks**
I	13
II	17
III	14
IV	16

CORE COURSE IV: 3B04CSC DATA STRUCTURES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
3	3B04CSC	4	4	3

COURSE OUTCOME

CO1: Able to analyze the complexity of algorithm.
CO2: Familiar with linear and nonlinear data structures.
CO3: Acquire the ability to select appropriate data structure for a given problem.
CO4: Obtain skill for systematic approach to programming.

Unit I:

Elementary Data Organization, Data Structures, Data Structure Operations. Classification of Data Structures; Linear Arrays - operations – Application: Polynomial- Representation with arrays; Polynomial addition ; Stack – Operations, Application: Evaluation of post fix expression ; Queue – Operations, Printer Queue as application, Circular Queue, Deque, Priority Queue; Linked Lists: Definition, Representation of Linked List in memory, Traversing Linked List, Searching a linked list, Memory Allocation and Garbage Collection , Insert into a linked list, Deletion from a linked list; Header Linked Lists; Two-way Lists – Operations.

(20 Hrs)

Unit II:

Trees – Binary Trees, Complete Binary trees, Extended Binary trees; Representing Binary trees in memory, Traversing Binary trees, Binary search trees – Searching and inserting in Binary Search Trees, Deleting in a Binary Search Tree, Heap – Heap sort, Huffman’s Algorithm; General Trees – Computer representation of general trees.

(16 Hrs)

Unit III:

Graphs – Graph Theory terminology; Sequential Representation of Graphs – Adjacency Matrix, Path Matrix ; Operations on graph – searching, inserting, deleting, traversing: Breadth- First Search and Depth First Search.

(16 Hrs)

Unit IV:

Design and Analysis of Algorithms: From Problems to Programs - Algorithms, Pseudo-Language and Stepwise Refinement; Abstract Data Types- Definition of Abstract Data Type, Data Structures and Abstract Data Types; The Running Time of a Program - Measuring the Running Time of a Program, Asymptotic Notations – Big O, Omega, Theta. Search: Linear and Binary search; comparison of searching algorithms. Sort: Insertion, bubble, selection, quick and merge sort; Comparison of Sort algorithms.

(20 Hrs)

Books for Study:

1. Schaum's Outline of Theory and Problems of Data Structures – SymourLipschutz – Mc-Graw Hill Book Company.
2. Data Structures and Algorithms- Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman – Pearson Education.

Books for Reference:

1. Data Structures and Algorithms: Concepts, Techniques and Applications; GAV Pai, McGraw Hill, 2008.
2. Data Structures in C, Achuthsankar and Mahalekshmi, PHI, 2008
3. Fundamentals of Data structures in C++, 2nd Edn, Horowitz Sahni, Anderson, Universities Press
4. Classic Data structures, Samanta, Second Edition, PHI

Marks including choice:

Unit	Marks
I	19
II	11
III	11
IV	19

GENERAL AWARENESS COURSE III: 4A13CSC DIGITAL ELECTRONICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
4	4A13CSC	3	3	3

COURSE OUTCOME

CO1: Introduce the basic and important concepts of Digital Principles and Applications.
CO2: Familiarize with basic building blocks of Digital systems, Digital Logic and Digital Circuits.
CO3: Design simple combinational digital systems.
CO4: Familiarize different number systems, codes and data representation.

Unit I:

Digital Concepts: Digital and Analog Quantities – Binary Digits, Logic Levels and Digital Waveforms - Basic Logic – Number Systems: Decimal, Binary, Hexa-decimal and Octal – Conversions -CODES: BCD, ASCII, Excess-3, GRAY and UNICODE. BINARY ARITHMETIC: Addition, Compliments, Subtraction using Complements (r's and (r-1)'s).

(10 Hrs)

Unit II:

LOGIC GATES: Inverter-AND-OR-NAND-NOR-XOR-XNOR, BOOLEAN ALGEBRA AND LOGIC SIMPLIFICATION: Boolean operations and Expressions – Laws and Rules of Boolean Algebra – De-Morgan's Theorem – Boolean analysis of Logic Circuits – K-Map and Function Simplification using K Map– SOP and POS

(15 Hrs)

Unit III:

Combinational Circuits: Basics of Combinational Logic Circuits – Implementing Combinational Logic – Universal Property of NAND and NOR gates, Adders (Half, Full and Parallel) – Comparators – Decoders – Encoders – Multiplexers - Demultiplexers-Parity Generators-Parity Checkers.

(15 Hrs)

Unit IV:

Sequential Circuits:-Latches, Flip Flops – SR, JK Flip flops – Master Slave Flip flop. COUNTERS: Asynchronous counters - Synchronous counters- Shift Registers in Detail.

(14 Hrs)

Books for Study:

1. Digital Fundamentals, Floyd and Jain, 8th Edn, Pearson Education.
2. Computer system Architecture – M. Morris Mano - PHI Pvt Limited.

Books for Reference:

1. Digital Principles and Applications; Leach and Malvino, GoutamSaha; TMH; 7th edition (Special Indian Edition).

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

GENERAL AWARENESS COURSE IV: 4A14CSC OPERATING SYSTEMS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
4	4A14CSC	3	3	3

COURSE OUTCOME

CO1: Familiarize with basics of design of operating systems.
CO2: Introduce basic working process of operating systems.
CO3: To understand the importance process and scheduling.
CO4: To understand the issues in memory management.

Unit I: Introduction

Functions of an operating system, Kernel Data Structures, Operating Systems in different Computing Environments, Operating System Services, Operating System Interfaces, System Calls (Introduction only), Operating System Design and Implementation approaches, Operating System Structures - simple, layered, micro kernel, modules, System Boot.

(13 Hrs)

Unit II: Process Management

Process Concept- The Process, Process State, Process Control Block Process Scheduling – Scheduling Queues, Schedulers, Context Switch - CPU Scheduling: Basic Concepts – CPU scheduler, Pre-emptive scheduling, Dispatcher - Scheduling Criteria – Scheduling Algorithms - FCFS, SJFS, Priority Scheduling, Round Robin Scheduling.

(14 Hrs)

Unit III: Deadlock

Dead locks: Characterization – necessary conditions – Resource allocation graph – Methods for handling deadlock - Deadlock prevention – mutual exclusion, hold and wait, no preemption, circular wait – Deadlock avoidance – safe state, Resource allocation graph, Banker’s algorithm, Safety algorithm, Resource request algorithm – Deadlock detection – single instance of each resource type, several instances of a resource type - recovery from dead lock – process termination, resource preemption.

(15 Hrs)

Unit IV: Memory Management

Main Memory: Swapping, Contiguous Memory Allocation, Segmentation, Paging, Virtual Memory: Demand Paging, Copy-on-Write, Page Replacement - Basic, FIFO Page Replacement, Optimal Page Replacement, LRU Page Replacement

Mass Storage Structure: Disk Structure-Disk Scheduling: FCFS Scheduling, SSTF Scheduling, SCAN Scheduling-SCAN Scheduling, LOOK Scheduling - Selection of a Disk Scheduling Algorithm

(12 Hrs)

Books for Study:

1. Abraham Silberschatz, Peter B Galvin, Greg Gagne, Operating System Concepts, 9/e, Wiley India, 2015.

Books for Reference:

1. Garry Nutt, Operating Systems: 3/e, Pearson Education, 2004
2. Dhananjay M. Dhamdhere, Operating Systems A Concept Based Approach, 3rd Ed, TMH
3. William Stallings, Operating Systems: Internals and Design Principles, Pearson, Global Edition, 2015.
4. Andrew S Tanenbaum, Herbert Bos, Modern Operating Systems, Pearson, 4/e, 2015.
5. Madnick S. and J. Donovan, Operating Systems, McGraw Hill, 2001.
6. Deitel H. M., An Introduction to Operating System Principles, Addison-Wesley, 1990.

Marks including choice:

Unit	Marks
I	14
II	16
III	16
IV	14

CORE COURSE V: 4B05CSC SOFTWARE ENGINEERING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
4	4B05CSC	4	4	3

COURSE OUTCOME

CO1: To understand the Software Development Life Cycle Models.
CO2: To familiarize with Software Requirement Analysis and Specification.
CO3: To familiarize with Classical Software Design Techniques.
CO4: To familiarize with various Software Testing Techniques and Tools.

Unit I: Introduction to software engineering

Definition, program versus software, software process, software characteristics, brief introduction about product and process, software process and product matrices; Software life cycle models – Definition, waterfall model, increment process model, evolutionary process model, selection of the life cycle model.

(18Hrs)

Unit II: Software Requirement Analysis and Specification

Requirements engineering, types of requirements, feasibility studies, requirement elicitation, various steps of requirement analysis, requirement documentation, requirement validation.

(18Hrs)

Unit III: Software design

Definition, various types, objectives and importance of design phase, modularity, strategy of design, function-oriented design. Objected Oriented Design – Analysis, design concept, design notations and specifications, design methodology.

(18Hrs)

Unit IV:Software Testing

What is testing?, Why should we test?, who should do testing?, test case and Test suit, verification and validation, alpha beta and acceptance testing, functional testing, techniques to design test cases , Boundary value analysis, equivalence class testing, decision table based testing, cause effect graphing techniques; structural testing, path testing, cyclomatic complexity, mutation testing, levels of testing, unit testing, integration testing, system testing, validation testing

(18Hrs)

Books for Study:

1. Software Engineering (Third Edition), K KAggarwal, Yogesh Singh, New age International Publication (For Module 1,2,4 and case study of Module 3)
2. An integrated approach to software Engineering (Second Edition), PankajJalote, Narosa Publishing House - (For Module 3).
3. Computer system Architecture – M. Morris Mano - PHI Pvt Limited.

Books for Reference:

1. Fundamentals of Software Engineering Rajib Mall PHI Publication
2. Software Engineering (Seventh edition), Ian Sommerville – Addison Wesley.
3. Software Engineering A practitioner's approach (Sixth Edition), Roger S Pressman-McGraw Hill.
4. Fundamentals of Software Engineering (Second Edition), Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli – Pearson Education.

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

CORE COURSE VI: 4B06CSC LAB 2 – DATA STRUCTURES USING C++

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
4	4B06CSC	3*	3	3

*Lab will be conducted for 3 hours each in III and IV Semesters

Guidelines

Design C++ programs for the following questions

All concepts must be implemented using classes

main() function create the object of the class and use the property.

SECTION - A

1. Implement Linear search algorithm and print number of comparisons (1hr.)
    Input: Number of numbers must be greater than 20, Number to search
    Output: Found/Not Found, No. of Comparisons
2. Implement Binary search algorithm and print number of comparisons (1hr.)
    Input: Sorted List and Number to search
    Output: Found/ Not Found, No. of Comparison
3. Implement Insertion sort algorithm and print number of comparisons (1hr.)
    Input: Number of numbers must be greater than 20
    Output: Sorted List, No. of Comparison
4. Implement Bubble sort algorithm and print number of comparisons (1hr.)
    Input: Number of numbers must be greater than 20
    Output: Sorted List, No. of Comparison
5. Implement Quick sort algorithm and print number of comparisons (2hrs,)
    Input: Number of numbers must be greater than 20
    Output: Sorted List, No. of Comparison
6. Implement Selection sort algorithm and print number of comparisons (1hr.)
    Input: Number of numbers must be greater than 20
    Output : Sorted List, No. of Comparison
7. Implement Merge sort algorithm and print number of comparisons (1hr.)
    Input: Number of numbers must be greater than 20
    Output : Sorted List, No. of Comparison
8. Add two general Polynomial(1hr.)

Input: Highest Power of Each Polynomial and quotients of each power

Output: Resultant Polynomial

9. Subtract two general Polynomial(1hr.)

   Input: Highest Power of Each Polynomial and quotients of each power

   Output: Resultant Polynomial

10. Extract substring of given dimension from given string (1hr.)

    Input: String, Start Index, No. of characters

    Output: Substring

11. Evaluate polynomial entered by user with respect to given value of x (1hr.)

    Input: highest power of polynomial, Coefficients, value of x

    Output: Value of polynomial with respect to given x value.

SECTION- B

12. Implement Stack Operations (2hrs.)

    Input: Size of Stack, choice for menu 1. Push 2. Pop 3. Traverse 4. Exit and data item

    Output: with respect to choice

13. Evaluate post fix expression with the support of stack (2hrs.)

    Input: Post Fix Expression\

    Output: Evaluated Result

14. Implement Queue Operations (1hr.)

    Input: Size of Queue, choice for menu 1. Insert 2.Delete 3. Traverse 4. Exit and item

    Output: with respect to choice

15. Implement Circular Queue Operations (2hrs.)

    Input: Size of Queue, choice for menu 1. Insert 2. Delete 3. Traverse 4. Exit and item

    Output: with respect to choice

16. Implement following Linked list Operations (1hr.)

    Input: Choice for menu 1. Insert 2. Delete 3. Traverse 4. Exit and data item

    Output: with respect to choice

17. Implement following Linked list Operations (2hrs.)

Input: Choice for menu 1. Insert after a given node 2. Delete given node 3,traverse 4.exit and data item

Output: with respect to choice

18. Implement following Two Way List Operations (2 hrs.)

Input: Choice for menu 1. Insert 2. Insert after a given node 3. Delete given node 4. Delete 5. Traverse 6. Exit and data item

Output: with respect to choice

19. Implement following Binary Search Tree operations (2 hrs.)

Input: choice for menu 1. Insert 2. Delete 3. Infix traversal 4. Prefix 5. Postfix 6. Exit and item

Output: with respect to choice

CORE COURSE VII: 4B07CSC LAB 3 – DATABASE MANAGEMENT SYSTEM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
4	**4B07CSC**	**2***	**2**	**3**

*Lab will be conducted for 2 hours each in III and IV Semesters

CORE COURSE VIII: 5B08CSC WEB TECHNOLOGY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5B08CSC	4	4	3

COURSE OUTCOME

CO1: Understand different components in web technology and WWW.
CO2: Learn to develop interactive Web pages.
CO3: Present a web document with server-side scripting using PHP.
CO4: Know the basics of AJAX.

Unit I: Introduction

Introduction to Internet and WWW, Evolution of the Internet and World Wide Web, Web Basics, Static Vs Dynamic web pages, Client-Side Scripting versus Server-Side Scripting, World Wide Web Consortium (W3C). Web hosting, Types of web hosting, Hosting Space, Domain Name Registration, Free Hosting, Responsive Web designing.

(12 Hrs)

Unit II: Introduction to HTML

Introduction to HTML, Editing HTML5, W3C HTML5 Validation Service, Headings, Linking, Images, Special Characters and Horizontal Rules, Lists, Tables, Forms, HTML5 Form Input types, input and data list Elements and autocomplete Attribute, Page structure Element.

(18 Hrs)

Unit III: Scripting with JavaScript

Introduction to JavaScript, memory concepts, operators, functions – Introduction, Program Modules in JavaScript, Function Definitions, Notes on Programmer-Defined Functions, scope rules and recursion, arrays – introduction, declaring and allocating arrays, examples using arrays, objects – math, string and date objects, dialog boxes.

(22 Hrs)

Unit IV: PHP and Ajax Enabled Rich Internet Applications

Introduction to PHP, converting between datatypes, operators, initializing and manipulating arrays, string concatenations, Form processing.

Introduction to AJAX, Traditional Web Applications vs. Ajax Applications, Traditional web applications, Ajax applications, Rich Internet Applications (RIAs) with Ajax, History of Ajax.

(20 Hrs)

Books for Study:

1. Internet & World Wide Web How to Program, 5/e – Paul J Deitel, Harvey M Deital, AbbaeyDeital
2. Julie C. Meloni, HTML and CSS in 24 Hours, Sams Teach Yourself (Updated for HTML5 and CSS3), Ninth Edition
3. Programming in PHP, O'Reilly

Books for Reference:

1. Mastering HTML, CSS &Javascript Web Publishing Paperback,2016 - by Laura Lemay, Rafe Colburn & Jennifer Kyrnin , BPB Publications
2. HTML & CSS: The Complete Reference, Fifth Edition - Thomas a Powell, Tata McGraw Hill
3. JavaScript – Definitive Guide O'Reilly 6th Edition
4. https://www.w3schools.com

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

CORE COURSE IX: 5B09CSC JAVA PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5B09CSC	4	4	3

COURSE OUTCOME

CO1: Know the overall structure and concept of logic building activity of Java programming language

CO2. Identify the real-world things as well as the relationship between them and understand transforming them into their corresponding computer representations.

CO3. Realize how to achieve code reusability using inheritance, interfaces and packages and expedite application development activities.

CO4. Familiarize simple and robust way of handling multitasking and runtime error as well as such kind of abnormal situations within a program.

CO5. Design GUI based applications and applications that can be transmitted over internet.

Unit I:

Introduction to Java programming: Java history; features of java; Byte Code; Overview of Java, Java Language fundamentals: Building blocks; Data types; variables And Arrays. Operators - Arithmetic, Bitwise, Relational, Boolean Logical, Assignment; Control statements.

(12 Hrs)

Unit II:

Introducing Classes: Class fundamentals; Introducing methods; Declaring Objects; Constructors; This keyword; Garbage collection; the finalize method; A closer look at methods and classes; Inheritance basics; Using Super; When Constructors are called; Method Overriding; Dynamic method dispatch; Abstract classes; Uses of final keyword.

(20 Hrs)

Unit III:

Packages: Introduction-Creating a Package- CLASSPATH; Accessing a package- simple program using package; Interfaces: definition-extending interface-implementing interface-simple programs using interface. Exception handling: Basics; Try, catch, finally, multiple catch, nested try, throw; User Defined exception; Chained Exception; Multi-threading: introduction -Creating threads; thread life cycle; thread Priorities, Synchronization. Enumeration and Auto boxing.

(20 Hrs)

Unit IV:

Applets: Fundamentals [page- 318]; Applet skeleton [pg-751], The HTML APPLET tags; The Abstract Window Toolkit:- Introduction to AWT classes; AWT controls (Labels, Buttons, Check box, Radio buttons; Choice control; List, Text box, Scroll bars). Event handling of Buttons and keyboard, Introduction to JDBC.

(20 Hrs)

Books for Study:

1. Java The Complete Reference-Ninth Edition- Oracle Press- Herbert Schildt

Books for Reference:

1. Java complete reference by BalaguruSwamy
2. Core Java 2, Cay S. Horstmann, Gary Cornell, Pearson Education
3. Dr. S. B. Kishor, Rajani Singh etc, PROGRAMMING IN JAVA, 1st Ed. published by DAS GANU Prakashan, Nagpur in Mar. 2018. (ISBN: 978-93-84336-49-3)

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

CORE COURSE X: 5B10CSC COMPUTATION USING PYTHON

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5B10CSC	3	3	3

COURSE OUTCOME

CO1: Learn Python for expressing computation
CO2: Familiarize with functions and modules in python
CO3: Understand object-oriented programming concepts
CO4: Learn the techniques for database connectivity and GUI programming in Python

Unit I: Basic Elements and Control Statements

Features of Python, Different Methods to Run Python, Basic Elements (Objects, Expressions, Numerical Types, Strings, Variables), Comments, Indentation in Python, Input and Output in Python, import function, Operators in Python, Branching (if, else, elif), Iteration (while, for), range and enumerate functions, Tuples, Lists, Sets, Dictionaries, Built-in methods of lists, sets and dictionaries, Mutable and Immutable Objects.

(14 Hrs)

Unit II: Functions, Modules and Exception Handling

Functions Definition, Function Calling, Function Arguments (Required, Keyword, Default), Recursion, Modules, Built-in Modules, Creating Modules, File Handling (Opening, Closing, Writing, Reading), Exceptions, Built-in Exceptions (IndexError, OverflowError, ZeroDivisionError, RuntimeError), Exception Handling.

(16 Hrs)

Unit III: Object Oriented Programming, numpy Arrays and Data Visualization

Class Definition, Object Creation, Built-in Attribute Methods, Object Oriented Programming Features of Python. Arrays in Python, Numpy Module, ndarray, Creating Arrays (array, zeros, ones, empty, linspace, arrange, random), Two-Dimensional Array, Indexing, Slicing, Iterating, Copying, Splitting, Shape Manipulation (reshape, transpose, resize), Arithmetic Operations on Arrays. Data Visualization in Python matplotlib Module, pyplot, plot(), scatter, bar charts, Formatting, figure(), subplot(), text(), xlabel(), ylabel(), title(), Plotting Simple Mathematical Functions (sin x, x^2)

(10 Hrs)

Unit IV: Connecting to Database and GUI Programming

Connecting to a Database, Basic Operations on Database (Crater, Insert, Update, Delete), Fetching Data from a Database, Transaction Control.

GUI Programming using Tkinter, Tkinter Widgets (Label, Message, Entry, Text, Button, tkMessagebox, RadioButton, Checkbutton, Listbox, Menu, Menubutton, Scale, Scrollbar, Canvas), Layout Managers.

(14 Hrs)

Books for Study:

1. Taming Python By Programming, Dr. Jeeva Jose, Khanna Publishing
2. Introduction to Computation and Programming Using Python with Application to Understanding Data - John V. Guttag, PHI (2016)
3. https://www.numpy.org/devdocs/user/quickstart.html
4. https://matplotlib.org/users/pyplot_tutorial.html

Books for Reference:

1. https://www.tutorialspoint.com/python/
2. Introduction to Computer Science using Python - Charles Dierbach, Wiley (2015)
3. Python for Education by Ajith Kumar B P
4. https://docs.python.org/3/tutorial/index.html
5. Introduction to Computer Science and Programming Using Python Provided by Massachusetts Institute of Technology (MITx)
   Available at: (https://www.edx.org/course/introduction-to-computer-science-and-programming-using-python-2)

Marks including choice:

Unit	Marks
1	15
2	15
3	15
4	15

CORE COURSE XI: 5B11CSC-A ALGORITHM DESIGNING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5B11CSC-A	4	4	3

COURSE OUTCOME

CO1: Capable to select suitable algorithm design technique.
CO2: Able to design optimum algorithms for problems.
CO3: Skilled to design solutions for real problems.

Unit I:

Divide and Conquer – General method;Binary search, Finding the maximum and minimum, Merge sort, Quick sort, Performance measurement of quick sort, Strassen's matrix multiplication.

(20Hrs)

Unit II:

Greedy method – General method, Knapsack problem, job sequencing with deadlines, minimum cost spanning trees, prim's algorithm, kruskal's algorithms, optimal merge patterns, single source shortest path.

(22 Hrs)

Unit III:

Dynamic programming – General method, multistage graph, all pairs shortest path, single shortest path, 0/1 knapsack travelling salesperson problem.

(15Hrs)

Unit IV:

Backtracking – General method, 8-queens problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

(15Hrs)

Books for Study:

1. Ellis Horowitz, SartajSahni, S Rajasekharan – Computer Algorithms/C++ - Second Edition, Universities press, 2008 (Paperback Edn)

Books for Reference:

1. Introduction to the design and Analysis of Algorithms, AnanyLevitin, 2nd Edn, Pearson education.
2. The design and analysis of computer Algorithms Alfred V Aho John E Hopcroft Pearson Education.
3. Algorithm Design, Foundation, Analysis and Examples, Dr. Vijayakumar and Dr. Juby Mathew, Vimala Publications.

Marks including choice:

Unit	Marks
I	17
II	17
III	13
IV	13

CORE COURSE XI: 5B11CSC-B LINUX ADMINISTRATION

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5B11CSC-B	4	4	3

COURSE OUTCOME

CO1: To learn basic Linux commands and understand the file system structure
CO2: To understand the Boot loaders and the configuration files
CO3: To learn different system services, maintenance and configuring these
CO4: To experience Shell Scripting

Unit I:

Linux OS: History, Features and benefits of Linux, basic concepts of multi user system , open source, free Software concepts, Types of users in Linux, Types of files. BASICS : login, password, creating an account, shell and commands, logout, changing password, files and directories, relative and absolute pathnames, directory tree, current working directory, referring home directory, creating new directories, copying files, moving files, deleting files and directories , wild cards, hidden files, cat command.

(20 Hrs)

Unit II:

Vi editor: different modes-command mode, insert mode, last line mode, vi Editing commands – moving within a file, deleting, editing,Copy and Paste Commands, Saving and Closing the file, redirecting input/output-filter, pipes. File permissions: user, group, ls command (long listing), changing file permission. Shell Scripting: Types of shell, Basic shell configuration for bourne and bash shell: /etc/profile, /etc/bashrc, ~/.bash_profile, ~/.bash_login, ~/.profile,~/.bashrc, ~/.bash_logout, ~/.bash_history. Bourne shell scripts, script execution, variables and parameters, Control structures - Shell if then else, Shell if then elif, Shell for loop, Shell while loop, Shell until loop, Shell case, Shell function.

(20 Hrs)

Unit III:

Linux Boot process: LILO - boot process, /edc/lilo.conf file, GRUB - /etc/grub.conf file runlevels, rc files, startup scripts. Mounting: mounting file systems, structure of /etc/fstab. Linux Administration: Major services in Linux system - init, /etc/inittab file, login from terminal, syslog and its configuration file /etc/syslog.conf, periodic command execution: at and cron, crontab file, GUI, X windows. Starting and stopping different services – service command.

(16 Hrs)

Unit IV:

System Maintenance: tmpwatch command, logrotate utility. Backup and Restore: types of backup - full, differential, incremental, cp, tar commands. Linux Installation: Partitioning, MBR, SWAP, file system mount points, rpm utility - installation of packages.

(16 Hrs)

Books for Study:

1. Unix Shell Programming, Yeshwanthkanethkar
2. Essential System Administration, O'reilly& Associates.

Books for Reference:

1. Unix in a Nutshell, by Daniel Gilly, O'Reilly & Associates.
2. Linux Administration handbook, Nemeth, PHI.
3. Red Hat Linux Bible.
4. A user guide to the Unix system, Thomas, Yates Tata McGraw Hill

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

CORE COURSE XI: 5B11CSC-C COMPUTER GRAPHICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5B11CSC-C	4	4	3

COURSE OUTCOME

CO1: Understand basic concepts of graphics input and display devices.
CO2: Learn line and circle drawing algorithms.
CO3: Familiarization with 2D and 3D transformations and projections.
CO4: Understand fundamentals of image processing.

Unit I:

Introduction, Overview of Graphics Systems, Display devices, Input devices, Hard-Copy devices, Graphics software.Line Drawing Algorithms-DDA, Bresenham, Circle Generating Algorithm – Midpoint Algorithm, Area filling algorithms – Flood Fill and Boundary Fill algorithms.

(18 Hrs)

Unit II:

Output primitives-Color and Grayscale levels, 2D Transformations-Translation, Rotation, Scaling, Reflection, Shear, Matrix Representation and Homogenous Coordinates, Composite Transformations.

(18 Hrs)

Unit III:

Two-Dimensional viewing, Window-to-viewport Transformation, Clipping - Point Clipping, Line Clipping – Cohen Sutherland Algorithm, Polygon Clipping – Sutherland Hodgeman Algorithm, Text clipping.

(18 Hrs)

Unit IV:

3D object representations-Polygon surfaces, Polygon tables, Plane equations, Polygon Meshes, 3D transformations-Translation, Rotation, Scaling, Rotation about an arbitrary axis, Reflection, Shear, 3D viewing- Parallel Projection, Perspective Projection.

(18 Hrs)

Books for Study:

1. Donald D Hearn and M. Pauline Baker, Computer Graphics, C Version, 2nd Edition, Pearson.

Books for Reference:

1. Foley, van Dam, Feiner& Hughes, Computer Graphics: Principles and Practice in C, 2nd Edition, Pearson
2. Ranjan Parekh, Principles of Multimedia, Tata McGrawHill,2006
3. D.P. Mukherjee, Fundamentals of Computer Graphics and Multimedia, PHI.
4. David Rogers, Procedural Elements of Computer Graphics, Rogers, 2^{nd} Edition, McGraw Hill Education.

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

CORE COURSE XII: DATA COMMUNICATION AND COMPUTER NETWORKING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B12CSC	4	4	3

COURSE OUTCOME

CO1: Understand state-of-the-art in network protocols, architectures and application.
CO2: To acquire knowledge about different computer networks
CO3: To understand the use of layer architecture for networking systems.

Unit I:

Introduction to data communication, important elements /components of data communication. Transmission media- Guided media, Unguided media. Synchronous / Asynchronous data transmission.Line configuration – Simplex, Half duplex, Duplex.Network topologies – star, Bus, ring, Mesh. Computer networks, Use, network hardware, network structure- point to point connection, multicast, broadcast, classification of networks-LAN, WAN, MAN.

(18 Hrs)

Unit II:

Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / Ip models. Data Link Layer, Design issues, Services to network layer, Framing- character count, character stuffing, bit stuffing, physical layer coding violation. Error control, flow control, Elementary data link protocols- unrestricted simplex protocol, simplex stop and wait protocol, simplex protocol for a noisy channel.

(18 Hrs)

Unit III:

Network layer, design issues, services to the transport layer, routing algorithms- adaptive, non-adaptive algorithms, optimality principle, dijkstras shortest path routing algorithm, flow-based routing, hierarchical routing, congestion control algorithms–the leaky bucket algorithm, the token bucket algorithm.

(18 Hrs)

Unit IV:

Transport layer, design issues, connection management-addressing, establishing and releasing connection, transport layer protocols- TCP, UDP

Application layer – Basic Idea of telnet, ftp, http, smtp, pop3.

(18 Hrs)

Books for Study:

1. Computer Networks, Andrew S. Tanenbaum& David J. Wetherall, Pearson.

Books for Reference:

1. Data Communication and Networking, Behrouz A. Forouzan, McGraw Hill Education.
2. Achyut S. Godbole and AtulKahate, Data communication and Networks, 2nd Ed, McGraw Hill
3. Computer Networking: A Top-Down Approach, Kurose James F. and Ross Keith W., Pearson.
4. R. S. Rajesh, K. S. Easwara Kumar and R. Balasubramanian, Computer Networks – Fundamentals and Applications, Vikas Publishing House.

Marks including choice:

Unit	Marks
1	15
2	15
3	15
4	15

CORE COURSE XIII: 6B13CSC COMPILER DESIGN

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B13CSC	4	4	3

COURSE OUTCOME

CO1: Learn the basic principles of compiler.
CO2: Get an idea about the related programs.
CO3: Understand different components of a compiler.
CO4: Understand the phases of a compiler.

Unit I: INTRODUCTION TO COMPILING

Compilers, Analysis of the Source program, phases of a compiler, cousins of the compiler, grouping of phases, compiler construction tools.

(18Hrs)

Unit II: LEXICAL ANALYSIS

Role of Lexical Analyzer, Input buffering, Specification of tokens, recognition of tokens, Finite Automata.

(18Hrs)

Unit III: SYNTAX ANALYSIS

The role of a Parser, context free grammars, Top down parsing, Recursive Descent Parsing, Predictive Parsers, bottom up parsing, shift reduce parsing, operator precedence parsing.

(18Hrs)

Unit IV: CODE GENERATION & OPTIMIZATION

Symbol table, Intermediate languages, Issues in the design of code generator, the target machine, basic blocks and flow graphs, peep-hole optimization, principal sources of optimization, optimization of basic blocks, Loops in flow graphs

(18Hrs)

Books for Study:

1. Alfred V Aho, Ravi Sethi& Jeffrey D Ullman, “Compilers- Principles, Techniques and Tools”, Pearson education

Books for Reference:

1. KVN Sunitha,Compiler Construction, Pearson Education

2. Parag H Dave, Himanshu B Dave, Compilers –Principles and Practice

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

CORE COURSE XIV: 6B14CSC COMPUTER ORGANIZATION

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B14CSC	3	3	3

COURSE OUTCOME

CO1: Understand the basic terminology of computer system.
CO2: Understand the functional units of a computer system.
CO3: Understand the basic operations of a computer system.
CO4: Understand the memory organization in a computer system.

Unit I:

Basic structure of computer-Types of computers-Functional Units-Basic Operational Concepts-Bus Structure-Multiprocessors and Multi computers-Data Representation-Fixed Point representation and floating-point representation.

(9 Hrs)

Unit II:

Register Transfer and Micro operations – Register Transfer language-Register Transfer-Bus and memory Transfer-Three state bus buffers-Memory Transfer-Basic Computer Organization and Design – Instruction Codes – Fetch & Decode Instructions – Register Reference Instructions – Memory Reference Instruction – Input output & Interrupt.

(14 Hrs)

Unit III:

Micro Programmed Control – Control Memory – Address sequencing – Central Processing Unit – General Register Organization – Control word – Stack Organization – Register stack - Memory Stack – Reverse Polish notation – Evolution of Arithmetic expressions – Instruction Formats – Addressing modes – Data Transfer and Manipulations – reduced Instruction set computer(RISC).

(16 Hrs)

Unit IV:

Input Output Organization– Input/Output Interfaces –Asynchronous Data Transfer – Modes of transfer –Priority Interrupt – Direct Memory Access (DMA) - Input Output Processor - Serial Communications. Memory Organization – Hierarchy – Main memory – Auxiliary Memory –Associative Memory – Cache memory – Mapping – Multiprocessors

– Characteristics of multiprocessors - Inter connection structures.

(15 Hrs)

Books for Study:

1. Computer system Architecture –M.Morris Mano - PHI Pvt Limited
2. Computer Organization - Carl Hamacher –International Edition

Books for Reference:

1. Computer Organization and Architecture, William Stallings, 7th Edn, Pearson Education.
2. Computer Architecture & Organization John P Hayes –McGraw Hill

Marks including choice:

Unit	Marks
I	10
II	18
III	15
IV	17

CORE COURSE XIV: 6B15CSC-A INFORMATION SECURITY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B15CSC-A	4	4	3

COURSE OUTCOME

CO1: To understand the need of information security and to master information security Concepts, mechanisms and services as well as issues related to information Security.
CO2: To be familiar with cryptography and its categories.
CO3: Distinguish public and private key crypto systems and familiarize the rsa crypto System.
CO4: To attain the knowledge of digital signature and its security services.

Unit I:

Introduction to Information Security-The need for Security, Principles of security - confidentiality, Authentications, Integrity, Non-repudiation.Types of attacks-Passive attacks, Active attacks, Virus, Worm, Trojan horse.Introduction to Cryptography and Steganography.

(15Hrs)

Unit II:

Symmetric Key Encipherment - Traditional symmetric Key Ciphers: Introduction-Kirchhoff's principle, cryptanalysis, categories of traditional ciphers; Substitution Ciphers- mono-alphabetic ciphers, polyalphabetic ciphers; Transposition Ciphers-keyless and keyed transposition ciphers, Stream and Block Ciphers.

(20Hrs)

Unit III:

DES: Data Encryption Standard:-Introduction, DES Structure-Initial and final permutations, DES function; Round Key Generation; Avalanche and completeness effect; Weak keys; Multiple DES- Double DES, Triple DES; Security of DES- Brute- force attack, Differential cryptanalysis, Linear cryptanalysis. Public key Cryptosystem: Principles of Public Key Cryptosystems; Applications of public Key Crypto systems, Requirement for Public Key Cryptosystem, Public Key Cryptanalysis. RSA Algorithm– Description of the Algorithm, The security of RSA

(18Hrs)

Unit IV:

Digital Signature:-Comparison between conventional and digital signature-Inclusion, Verification, Relationship, Duplicity; Process-needs for keys, signing the digest; Services-message authentication,message integrity, non-repudiation, confidentiality; Digital signature Forgery and types;Digital Signature Schemes-RSA digital signature scheme. **(19Hrs)**

Books for Study:

1. Behrouz A. Forouzan and DebdeepMukhopadhyay, Cryptography And Network Security, 3rd Ed, McGraw Hill (Units I, II, IV)
2. William Stallings, Cryptography and Network Security - Principles and Practice Paperback, 7th Ed, Pearson (Unit III)

Books for Reference:

1. Bishop Matt, Introduction to Computer Security, Addison-Wesley,2004.
2. Pieprzyk Josef, Hardjono Thomas and Seberry Jennifer, Fundamentals of Computer Security, Springer, 2003.

Marks including choice:

Unit	Marks
I	10
II	20
III	15
IV	15

CORE COURSE XIV: 6B15CSC-B DATA MINING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B15CSC-B	4	4	3

COURSE OUTCOME

CO1: To Introduce the Concepts of Data Mining and its Applications.
CO2: To Understand Investigation of Data using practical Data Mining Tools.
CO3: To Introduce Association Rules Mining.
CO4: To Introduce Clustering and Classification.

Unit I: Fundamentals of Data Mining

Introduction: Data Mining – Knowledge Discovery Process (KDD), Fundamentals of Data Mining. Functionalities of Data Mining, Classification of Data Mining Systems, Major Issues in Data Mining. Data Warehouse: Definition, Multi – User Architecture, OLAP, Data Warehouse Vs Heterogeneous DBMS, Data Warehouse Vs Operational DBMS, OLAP Vs OLTP, Needs of Data Warehouse. Multi -Dimensional Data Model, OLAP Operations, Data Warehouse Schema, Data Warehouse Architecture, Warehouse Server, Meta Data, OLAP Engine, Data Warehouse Backend Process.

(16 Hrs)

Unit II: Data Preprocessing

Data Preprocessing: Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Integration, Discretization and Concept Hierarchy Generation.

(20 Hrs)

Unit III: Association Rules and Clustering Techniques

Association Rule Mining: Apriori Algorithm, Partition Algorithm, FP – Tree Growth Algorithm, Generalized Association Rule. Partitioned Algorithm: K – Means Algorithm, K- Medoids Algorithm. Density – Based Clustering: DBSCAN. Categorical Clustering, STIRR.

(18 Hrs)

Unit IV:Classification

Classification Models: Introduction to Classification Models, Decision Tree: Definition, Tree Construction Principles, Best Split, Splitting Indices, Splitting Criteria. Introduction to Web, Spatial and Temporal Data Mining.

(18 Hrs)

Books for Study:

1. Data Mining Concepts and Techniques - Jiaweihan&MichelineKamber Harcourt, 2nd ED. 2005
2. Data Mining Techniques, Arun K Pujari, University Press

Books for Reference:

1. Intelligent Data Mining: Techniques and Applications, Da Raun, Guoqing Chen, Springer 1st Ed.
2. Data Mining: introductory and Advanced Topics, M. Dunham, Pearson Pub.

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

CORE COURSE XIV: 6B15CSC-C BIOINFORMATICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B15CSC-C	4	4	3

COURSE OUTCOME

CO1: Understand Bioinformatics and biological databases.
CO2: Understand Concept of Biology.
CO3: Understand Sequence alignment and Similarity search tools.
CO4: Structural bioinformatics and Bioinformatic tools.

Unit I: Introduction and Biological Databases

Introduction to bioinformatics, Molecular Biology and computational Biology, Goal, Scope, Applications and Limitations; Introduction to Biological databases – databases and types of databases, biological databases – primary, secondary and specialized; Information retrieval from biological databases.

(18 Hrs)

Unit II: Cell Biology and Genetics

Prokaryotes and Eukaryotes, Introduction to cell structure –Plant and animal cell, Introduction to DNA – Chemical nature of DNA, Central dogma of molecular biology.

(16 Hrs)

Unit III: Sequence Alignment

Pairwise sequence alignment – Global and local, Alignment algorithms – Dot matrix method, Dynamic programming method, Scoring matrices – PAM, BLOSUM, Statistical significance of Sequence alignment; Database Similarity Searching – BLAST, FASTA, Comparison of BLAST and FASTA, Statistical significance,Introduction to sequences.

(18 Hrs)

Unit IV: Structural Bioinformatics and Bioinformatic Tools

Structure of protein – Amino acids, peptide formation, Structural forms of protein; Protein structure visualization – SwissPDB viewer, Pymol, Rasmol; Bioinformatic tools (EMBOSS package, Expasy).

(18 Hrs)

Books for Study:

1. Essential Bioinformatics – JinXiong
2. Bioinformatics and molecular Evolution – T K Attwood and Paul G Higgs

Books for Reference:

1. Cell Biology, Genetics, Molecular biology, Evolution and Ecology – P S Verma, V K Agarwal.
2. Bioinformatics – A Practical guide to the analysis of genes and proteins - Andreas D. Baxevanis.

Marks including choice:

Unit	Marks
I	15
II	15
III	15
IV	15

CORE COURSE XVI: 6B16CSC LAB 4 – JAVA PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	**6B16CSC**	**4+2***	**3**	**3**

*Lab will be conducted for 4 hours in V semester and 2 hours in VI semester

CORE COURSE XVII: 6B17CSC LAB 5 – WEB TECHNOLOGY AND PYTHON PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	**6B17CSC**	**4+2***	**3**	**3**

*Lab will be conducted for 4 hours in V semester and 2 hours in VI semester

CORE COURSE XVIII: 6B18CSC PROJECT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B18CSC	6	5	-

PART B

B.SC. COMPUTER SCIENCE COMPLEMENTARY ELECTIVE COURSES

[FOR B.SC.MATHEMATICS/B.SC.STATISTICS/B.SC.PHYSICS/B.SC. ELECTRONICS PROGRAMMES]

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS (INTERNAL + EXTERNAL)
1C01CSC	INTRODUCTION TO COMPUTERS AND PROGRAMMING	1	2	2	3	8+32
1C01CSC	LAB 1: PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING	1	2	0	-	-
2C02CSC	PROGRAMMING IN C	2	2	2	3	8+32
2C02CSC	LAB 1: PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING	2	2	0	-	-
3C03CSC	WEB TECHNOLOGY WITH DATA BASE MANAGEMENT SYSTEM	3	3	2	3	8+32
3C03CSC	LAB 1: PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING	3	2	0	-	-
4C04CSC	COMPUTATION USING PYTHON	4	3	2	3	8+32
4C05CSC	LAB 1: PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING*	4	2	4	3	8+32

TOTAL 200 MARKS

- PRACTICAL DONE IN ALL THE 4 SEMESTER

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

CONTINUOUS EVALUATION FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	75%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE BEST TWO MARKS OBTAINED IN THE TESTS CONDUCTED.
COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	25%	ANY ONE COMPONENT

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**Short Answer**	**5 Questions x 1 Mark = 5 Marks**
	Answer all questions	5 Questions x 1 Mark = 5 Marks
Part B	**Short Essay**	**6 Questions x 2 Marks = 12 Marks**
	Answer any 4 questions	4 Questions x 2 Marks = 8 Marks
Part C	**Essay**	**5 Questions x 3 Marks = 15 Marks**
	Answer any 3 questions	3 Questions x 3 Marks = 9 Marks
Part D	**Long Essay**	**4 Questions x 5 Marks = 20 Marks**
	Answer any 2 questions	2 Questions x 5 Marks = 10 Marks
Total Marks Including Choice: 52		
Maximum Marks for the Course: 32		

CONTINUOUS EVALUATION FOR PRACTICAL

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1: LAB SKILLS, OBSERVATION NOTE AND PUNCTUALITY	25% FOR LAB SKILL 25% FOR OBSERVATION NOTE AND PUNCTUALITY	OBSERVATION NOTE IS MANDATORY. MARKS SHOULD BE GIVEN CONSIDERING OBSERVATION NOTE LAB SKILLS AND PUNCTUALITY.
COMPONENT1: TEST	50%	MODEL EXAMINATION SHOULD BE CONDUCTED BEFORE EXTERNAL EXAM AND CONSIDERED FOR INTERNAL MARK

END SEMESTER EVALUATION FOR PRACTICAL

COMPONENT	PART A	PART B
Code Writing	7	7
Execution & Output	8	8
Record	2	
Total Marks	**32**	

COMPLEMENTARY ELECTIVE COURSE I: INTRODUCTION TO COMPUTERS AND PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1	1C01CSC	2	2	3

COURSE OUTCOME

CO1: Familiarize with the hardware components of a digital computer
CO2: Understand the basic idea of how data is represented in computers
CO3: Familiarize with types of software
CO4: Ability to design algorithmic solutions to problems

Unit I: Introduction to Computers

Characteristics of Computers, Computer System Hardware, Basic Concepts of CPU, ALU, Registers, Control Unit and System Bus, Components Inside a Computer Cabinet (Motherboard, BIOS, CMOS Chip, Ports and Interfaces, Expansion Slots, Memory Chips, Storage Devices, Processor - Basic functions), Computer Memory Representation, Memory Hierarchy, Basic Concepts of Cache Memory, Primary Memory (RAM and ROM), Secondary Memory Types (Working principle is not required).

(10 Hrs)

Unit II: Number System and Codes

Decimal, Binary, Hexa-Decimal and Octal Number Systems, Conversion Between Number Systems, Binary Arithmetic, Complements of Binary Numbers (1's Complement and 2's Complement), Signed Numbers, Floating Point Numbers, Binary Coded Decimal (8421 BCD Code, Applications, BCD Addition), Gray Code, ASCII Code, Unicode

(8 Hrs)

Unit III: Types of Software and Networking

System Software, Operating System (Functions of Operating Systems), Application Software, Software Acquisition (Retail, OEM, Demo, Shareware, Freeware, Open-Source Software), Computer Networks (Importance, Types of Networks – LAN, MAN, WAN).

(8 Hrs)

Unit IV: Introduction to Programming

Types of Computer Languages (Machine Language, Assembly Language, High-level Language), Basic Concepts of Compiler, Assembler, Interpreter, Linker and Loader.

Program Development Life Cycle, Algorithm, Flowcharts, Program Control Structures (Sequential, Selection, Loop), Programming Paradigms (Structured Programming, Basic Idea of Object-Oriented Programming), Characteristics of a Good Program

(10 Hrs)

Books for Study:

1. Anita Goel, Computer Fundamentals, Pearson
2. Thomas L. Floyd, Digital Fundamentals, 11th Edition, Pearson

Books for Reference:

1. Rajaraman V and Adabala N, Fundementals of Computers, PHI
2. Brian W Kernighan, D is for Digital: What a well-informed person should know about computers and communications, CreateSpace Independent Publishing Platform
3. Stewart Venit and Elizabeth Drake, Prelude to Programming (6th Edition), Pearson

Marks including choice:

Unit	Marks
I	17
II	13
III	9
IV	13

COMPLEMENTARY ELECTIVE COURSE II: PROGRAMMING IN C

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
2	2C02CSC	2	2	3

COURSE OUTCOME

CO1: Understand the building blocks of C programming language
CO2: Familiarize with program control structures in C
CO3: Learn procedural programming using functions
CO4: Understand user defined data types

Unit I: Introduction to C

C Character Set, Constants, Variables, Keywords, Instructions in C (Type Declaration, Arithmetic, Integer and Float Conversions), Operators in C (Arithmetic, Relational, Logical, Increment/Decrement, Assignment, Bitwise), Operator Precedence, Data Types (int, char, float, double, void), Compiling and Running C Programs in Linux.

(7 Hrs)

Unit II: Inputs and Control Statements

Formatted Console I/O Functions (printf, scanf), Escape Sequences, Unformatted Console I/O Functions (getch, putch, gets, puts), Decision control structures (Different forms of if statement), Conditional Operator, Case Control Structure (switch), Loop control structure (while, do-while, for), break and continue statements.

(10 Hrs)

Unit III: Functions and Pointers

User defined Functions (Advantages, Definition, Calling and Prototype), Library Functions, Pointers (Introduction to Pointers, Pointer Notation, Pointer Declaration and Initialization, Accessing Variable through Pointer), Call by Value and Call by Reference, Recursion

(10 Hrs)

Unit IV: Arrays, Strings and Structures

Arrays (Introduction, One Dimensional Arrays, Two Dimensional Arrays), Strings, Standard Library String Functions (strlen, strcpy, strcat, strcmp), Two-Dimensional Array of Characters. Storage Classes in C, Structures (Declaration, Initialization, Accessing Structure Elements), Array of Structures, Array Within Structure, Renaming Data Types with Typedef, C Preprocessors (#define, #include).

(9 Hrs)

Books for Study:

1. Yashavant P. Kanetkar, Let Us C, 16th Edition, BPB

Books for Reference:

1. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India
2. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill
3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

Marks including choice:

Unit	Marks
I	10
II	16
III	16
IV	10

COMPLEMENTARY ELECTIVE COURSE III: WEB TECHNOLOGY WITH DATABASE MANAGEMENT SYSTEM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
3	3C03CSC	3	2	3

COURSE OUTCOME

CO1: Develop skills to design a web page using HTML
CO2: Understand HTML Forms and CSS Styling
CO3: Develop skills to develop database and retrieve data using SQL
CO4: Learn basics of server-side programming with PHP

Unit I:HTML Basics

Introduction to WWW and HTML, Steps for hosting a website, Structure of HTML, HTML elements and attributes, Headings, Paragraphs, Formatting tags, line breaks, Comments, Links, Images, Lists, HTML5 Semantic Elements (header, footer, nav, section, article, nav, aside), HTML Tables.

(14 Hrs)

Unit II:HTML Forms and CSS

HTML Forms (input, select, textarea, button, datalist), Input types (text, password, submit, radio, checkbox, date, email), Input attributes (value, readonly, disabled, maxlength, autocomplete, list, min, max, placeholder), HTML5 form validation (required and pattern attribute of input type), Applying style to html using CSS (Inline, Internal and External CSS, Colors, Fonts, Borders, Padding, Applying style using class and id attribute)

(12 Hrs)

Unit III: Database Management System

Database Management System (Introduction, Simplified DBMS structure, advantages of DBMS, Database Administrators, Designers, End Users, System Analysts and Application Programmers), Relational Data Model (Domains, Attributes, Tuples, Relations), Relational Data Model Constraints (Domain Constraints, Key Constraints)

SQL Data Definition and Basic Data Types, Schema, DDL Statements (Create, Alter, Drop), Specifying Key Constraints in SQL, DML (Select, Insert, Update, Delete), Ordering Tuples, Renaming Attributes, Substring Pattern Matching and Arithmetic Operators, Aggregate Functions in SQL, Group By and Having, Joins (Inner and Outer)

(18 Hrs)

Unit IV: Introduction to PHP

Introduction to PHP, PHP basics (Variable, data types, Constants, Operators), Flow control (if, switch, while, for), Functions, Strings, Arrays, Form Handling (GET and POST methods), Connecting php to a database.

(10 Hrs)

Books for Study:

1. Julie C. Meloni, HTML and CSS in 24 Hours, Sams Teach Yourself (Updated for HTML5 and CSS3), Ninth Edition
2. RamezElmasri, Shamkant B. Navathe, Fundamentals of Database Systems, 7th Edition, Pearson
3. https://www.w3schools.com/php/

Books for Reference:

1. Powell, Thomas A. HTML & CSS: The Complete Reference. McGraw Hill Education; 5 edition.
2. Silberschatz, Abraham, Henry F. Korth, and ShashankSudarshan. Database system concepts. McGraw-Hill.
3. PHP: The Complete Reference, Steven Holzner, McGraw Hill Education
4. https://www.w3schools.com/css/
5. https://www.w3schools.com/html/

Marks including choice:

Unit	Marks
I	12
II	12
III	20
IV	8

COMPLEMENTARY ELECTIVE COURSE IV: COMPUTATION USING PYTHON

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
4	4C04CSC	3	2	3

COURSE OUTCOME

CO1: Learn Python for expressing computation
CO2: Familiarize with functions and modules in python
CO3: Understand object-oriented programming concepts
CO4: Learn the techniques for data visualization in python

Unit I: Basic Elements and Control Statements

Features of Python, Different Methods to Run Python, Basic Elements (Objects, Expressions, Numerical Types, Strings, Variables), Comments, Indentation in Python, Input and Output in Python, import function, Operators in Python, Branching (if, else, elif), Iteration (while, for), range and enumerate functions, Tuples, Lists, Sets, Dictionaries, Built-in methods of lists, sets and dictionaries, Mutable and Immutable Objects.

(16 Hrs)

Unit II: Functions, Modules and Exception Handling

Functions Definition, Function Calling, Function Arguments (Required, Keyword, Default), Recursion, Modules, Built-in Modules (math, statistics), Creating Modules, File Handling (Opening, Closing, Writing, Reading), Exceptions, Built-in Exceptions (IndexError, OverflowError, ZeroDivisionError, RuntimeError), Exception Handling.

(16 Hrs)

Unit III: Object Oriented Programming

Class Definition, Object Creation, Built-in Attribute Methods, Encapsulation, Data Hiding, Inheritance, Multi-Level Inheritance, Polymorphism (Method Overriding, Operator Overloading)

(10 Hrs)

Unit IV: Arrays and Data Visualization

Arrays in Python, Numpy Module, ndarray, Creating Arrays (array, zeros, ones, empty, linspace, arrange, random), Two-Dimensional Array, Indexing, Slicing, Iterating, Copying, Splitting, Shape Manipulation (reshape, transpose, resize), Arithmetic Operations on Arrays.

Data Visualization in Python (matplotlib Module, pyplot, plot(), hist, scatter, bar charts, Formatting, figure(), subplot(), text(), xlabel(), ylabel(), title(), Plotting Simple Mathematical Functions (sin x, x^2)

(12 Hrs)

Books for Study:

1. Taming Python By Programming, Dr. Jeeva Jose, Khanna Publishing
2. Introduction to Computation and Programming Using Python with Application to Understanding Data - John V. Guttag, PHI (2016)
3. https://www.numpy.org/devdocs/user/quickstart.html
4. https://matplotlib.org/users/pyplot_tutorial.html

Books for Reference:

1. https://www.tutorialspoint.com/python/
2. Introduction to Computer Science using Python - Charles Dierbach, Wiley (2015)
3. Python for Education by Ajith Kumar B P
4. https://docs.python.org/3/tutorial/index.html
5. Introduction to Computer Science and Programming Using Python Provided by Massachusetts Institute of Technology (MITx) - Available at : (https://www.edx.org/course/introduction-to-computer-science-and-programming-using-python-2)

Marks including choice:

Unit	Marks
1	15
2	15
3	10
4	12

COMPLEMENTARY ELECTIVE COURSE V: LAB 1 – PROGRAMMING IN C, WEB PROGRAMMING AND PYTHON PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
4	4C05CSC	2*	4	3

*Lab will be conducted for 2 hours each in I, II, III and IV semesters

COURSE OUTCOME

CO1: Achieve skills to use C language for problem solving
CO2: Understand SQL and basic web programming
CO3: Achieve skills to use Python for problem solving

Part I: C Programming

1. Write a program to receive an angle in degrees and check whether sum of the squares of sines and cosines of the angle is equal to 1. (Hint: Convert the angle in degrees to radians and apply mathematical functions).
2. Write a C program to check whether a year entered through the keyboard is leap year or not.
3. Write a program to reverse the digits of a positive integer number up to 5 digits. Display an error message if any other number is entered.
4. Write a program to enter numbers till the user wants. At the end, it should display the count of positive, negative and zeros entered.
5. Given the value of n, write a program to generate n Fibonacci numbers.
6. Create a menu driven calculator using switch statement. The menu should contain options for Addition, Subtraction, Multiplication, Division and Exit. The program should end only when the user enters the choice as Exit.
7. Create function which takes an integer value as parameter and returns 1 if the number is prime and 0 otherwise. Write a program which uses this function to generate first 100 prime numbers.
8. Write a program using recursion to find the factorial of a number.
9. Write a program to sort n numbers in ascending/descending order.
10. Write a program to check whether a string is palindrome or not.
11. Write a program to add two matrices. Display an error message if the matrices cannot be added due to incompatibility.

12. Create a structure student with membersroll_no, name and year_of_admn. Write a program to read n students into an array of the structure student. Write a function which takes year as argument and displays the names of students who joined that year. Get an input year from the user and display the student list using this function. (Hint: Make student array and number of students as global variables).

Part II: DBMS and Web Programming

To be updated

Part II: Python Programming

To be updated

PART C

B.SC. COMPUTER SCIENCE GENERIC ELECTIVE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

STUDENTS OF OTHER DEPARTMENTS CAN CHOOSE **ANY ONE OF THE GENERIC ELECTIVE COURSES FROM THE POOL OF FIVE COURSES.**

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS (INTERNAL + EXTERNAL)
5D01CSC	PROGRAMMING IN C	5	2	2	2	5+20
5D02CSC	WEB TECHNOLOGY	5	2	2	2	5+20
5D03CSC	DATABASE MANAGEMENT SYSTEM	5	2	2	2	5+20
5D04CSC	FUNDAMENTALS OF COMPUTERS AND PROGRAMMING	5	2	2	2	5+20
5D05CSC	INTRODUCTION TO PYTHON PROGRAMMING	5	2	2	2	5+20

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

CONTINUOUS INTERNAL ASSESSMENT FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	80%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE BEST TWO MARKS OBTAINED IN THE TESTS CONDUCTED.
COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	20%	ANY ONE COMPONENT

PATTERN OF QUESTION PAPER FOR END SEMESTER ASSESSMENT

Part A	**Short Answer**	**6 Questions x 1 Mark = 6 Marks**
	Answer all questions	6 Questions x 1 Mark = 6 Marks
Part B	**Short Essay**	**6 Questions x 2 Marks = 12 Marks**
	Answer any 4 questions	4 Questions x 2 Marks = 8 Marks
Part C	**Essay**	**2 Questions x 6 Marks = 12 Marks**
	Answer any 3 questions	1 Question x 6 Marks = 6 Marks
Total Marks Including Choice: 30		
Maximum Marks for the Course: 20		

GENERIC ELECTIVE COURSEI:5D01CSC PROGRAMMING IN C

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	**5D01CSC**	**2**	**2**	**2**

COURSE OUTCOME

CO1: To understand the basic knowledge of programming
CO2: To develop C programs
CO3: To develop skill in advanced program constructs
CO4: To develop skill in programming

Unit I:

Importance of C, C Tokens: Keywords, Identifiers, Constants, Operators- arithmetic operators, relational operator, logical operators and assignment operator. Fundamental data types, declaration of variables.

(8Hrs)

Unit II:

Data input and output functions: getchar(), putchar(),scanf(), printf(). Control statements: Branching: if, if-else, else...if ladder. Looping: while, do while and for loops.

(12Hrs)

Unit III:

Arrays: Introduction to Arrays - one dimensional array and two-dimensional arrays. Strings: basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat, strrev.

Functions: function declaration (prototype), function definition and calling a function. Recursion.

(10Hrs)

Unit IV:

Pointer: pointer declaration and initialization. Structures: structure definition, structure variable declaration, Initialization of structure variable, accessing a structure member.

(6Hrs)

Books for Study:

1. ANSI C, E. Balagurusamy, 3rd edition McGraw-Hill Publication

Books for Reference:

1. Programming with ANSI and Turbo C, Ashok N. Kamthane, 1edn, Pearson Education.
2. Programming with C in Linux, NIIT, PHI.

Marks including choice:

Unit	Marks
I	6
II	10
III	10
IV	4

GENERIC ELECTIVE COURSE II: 5D02CSC Web Technology

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5D02CSC	2	2	2

COURSE OUTCOME

CO1: To understand the knowledge of HTML
CO2: To understand the knowledge of various HTML tags
CO3: To enable students to program for the World Wide Web using HTML
CO4: To understand the basic knowledge of Java Script

Unit I: HTML Basics

Introduction to WWW and HTML, Steps for hosting a website, Structure of HTML, HTML elements and attributes, Headings, Paragraphs, Formatting tags, line breaks, Comments, Links, Images, Lists, HTML5 Semantic Elements (header, footer, nav, section, article, nav, aside).

(8 Hrs)

Unit II: HTML Tables and Forms

HTML Tables, HTML Forms (input, select, textarea, button, datalist), Input types (text, password, submit, radio, checkbox, date, email), Input attributes (value, readonly, disabled, maxlength, autocomplete, list, min, max, placeholder)

(12 Hrs)

Unit III: CSS

HTML5 form validation (required and pattern attribute of input type), Applying style to html using CSS (Inline, Internal and External CSS, Colors, Fonts, Borders, Padding, Applying style using class and id attribute).

(6 Hrs)

Unit IV: JavaScript

JavaScript: Introduction, data types, variables, operators, functions, arrays. Dialog boxes: Alert, confirm and prompt dialog boxes

(10 Hrs)

Books for Study:

1. Julie C. Meloni, HTML and CSS in 24 Hours, Sams Teach Yourself (Updated for HTML5 and CSS3), Ninth Edition
2. Javascript-Definitive Guide O'reilley 6th edn

Books for Reference:

1. Powell, Thomas A. HTML & CSS: The Complete Reference. McGraw Hill Education; 5 edition.
2. https://www.w3schools.com/css/
3. https://www.w3schools.com/html/

Marks including choice:

Unit	Marks
I	8
II	8
III	6
IV	8

GENERIC ELECTIVE COURSE III: 5D03CSC DATABASE MANAGEMENT SYSTEM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5D03CSC	2	2	2

COURSE OUTCOME

CO1: To understand the fundamentals of database management system
CO2: To develop Skill in designing database
CO3: To understand the concept of SQL commands
CO4: To develop Skill in writing queries

Unit I:

Introduction: Advantages of database systems, View of Data, data models (Network model, Hierarchical model, Relational model). Field, Record, Entity, Attribute, Relation, Domain, Tuple.

(8 Hrs)

Unit II:

Database Administrator, data base users, E-R model: basic concept, E-R diagram. Constraints: Primary key, not null, foreign key and Unique. Relational Algebra (Union, Intersection, Difference, Product, Project and Selection).

(10Hrs)

Unit III:

SQL: Introduction to SQL, database languages, DDL(create, alter, Drop), DML(Insert into, Select, update, Delete) and DCL commands. Data Types in SQL

(8Hrs)

Unit IV:

SQL Functions: aggregate, number, date and character functions. Operators (Arithmetic, Relational, Logical), Sub Queries (in Detail), Clauses (Having, Group By), Joins (Different Types of Join Statements), View, Introduction to Sequence.

(10 Hrs)

Books for Study:

1. Data Base Concept 3rd edition Abraham Silberschatz, Henery f Korth McGraw Hill
2. A Guide to the SQL Standard, C. J. Date and Hugh Darwen, 1997, Addison-Wesley

Books for Reference:

1. An Introduction to Database Systems, C. J. Date, 1994, Addison-Wesley
2. Understanding the New SQL, Jim Melton and Alan R. Simon, 1993, Morgan Kaufmann

Marks including choice:

Unit	**Marks**
I	5
II	9
III	8
IV	8

GENERIC ELECTIVE COURSE IV: 5D04CSC FUNDAMENTALS OF COMPUTERS AND PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5D04CSC	2	2	2

COURSE OUTCOME

CO1: To know the working principle of a computer
CO2: To understand the concept of number system
CO3: To understand the basics of computer network
CO4: To understand the basics of programming

Unit I:

Introduction to Computers: Characteristics, Generation, Basic operations of a computer system: Inputting, storing, processing, outputting and controlling, CPU, ALU, Control Unit, Main Memory Unit, Secondary storage devices: tape, floppy, hard disk, CD, DVD.

(12Hrs)

Unit II:

Representation of information: Number system: binary, octal and hexadecimal system, Conversion: decimal to binary, decimal to octal, decimal to hexadecimal, binary to decimal, octal to decimal and hexadecimal to decimal, Different code used: BCD, ASCII, EBCDIC, and GRAY Code.

(8Hrs)

Unit III:

Introduction to Computer networking: Goals, Transmission modes: simplex, half duplex and full duplex, Classification of networks: LAN, MAN and WAN, Topologies: bus, star, ring, and mesh.

(8 Hrs)

Unit IV:

Computer Programming: Introduction, algorithm, flowchart, characteristics of a good program. Programming languages: machine, assembly and high-level languages, Assembler, Compiler and Interpreter. Source code and object code.

(8Hrs)

Books for Study:

1. Computer Fundamentals, Pradeep.K. Sinha&PritiSinha, BPB Pub
2. Introduction to Information Technology, V. Rajaraman, Prentice Hal
3. Computer Networks 3rd Edn, A S Tanenbaum . Pearson Pub

Books for Reference:

1. Peter Norton, Introduction to Computers,6e, (Indian Adapted Edition)
2. B Forouzan, Introduction to data communication and networking

Marks including choice:

Unit	Marks
I	9
II	6
III	8
IV	7

GENERIC ELECTIVE COURSE IV: 5D05CSC INTRODUCTION TO PYTHON PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5D05CSC	2	2	2

COURSE OUTCOME

CO1: Learn Python for expressing computation
CO2: Learn about program control statements in python
CO3: Familiarize with functions and modules in python
CO4: Learn the techniques for data visualization in python

Unit I:

Features of Python, Different Methods to Run Python, Basic Elements (Objects, Expressions, Numerical Types, Strings, Variables), Comments, Indentation in Python, Input and Output in Python, import function, Operators in Python.

(12 Hrs)

Unit II:

Branching (if, else, elif), Iteration (while, for), range and enumerate functions, Tuples, Lists, Sets, Dictionaries, Built-in methods of lists, sets and dictionaries, Mutable and Immutable Objects.

(8 Hrs)

Unit III:

Functions Definition, Function Calling, Function Arguments (Required, Keyword, Default), Recursion, Modules, Built-in Modules (math, statistics), Creating Modules, File Handling (Opening, Closing, Writing, Reading), Exceptions, Built-in Exceptions (IndexError, OverflowError, ZeroDivisionError, RuntimeError), Exception Handling.

(8 Hrs)

Unit IV:

Arrays in Python, Numpy Module, ndarray, Creating Arrays (array, zeros, ones, empty, linspace, arrange, random), Two-Dimensional Array, Indexing, Slicing, Iterating, Copying, Splitting, Shape Manipulation (reshape, transpose, resize), Arithmetic Operations on Arrays.

Data Visualization in Python (matplotlib Module, pyplot, plot(), hist, scatter, bar charts, Formatting, figure(), subplot(), text(), xlabel(), ylabel(), title(), Plotting Simple Mathematical Functions (sin x, x^2).

(8 Hrs)

Books for Study:

1. Computer Fundamentals, Pradeep.K. Sinha&PritiSinha, BPB Pub
2. Introduction to Information Technology, V. Rajaraman, Prentice Hal
3. Computer Networks 3rd Edn, A S Tanenbaum . Pearson Pub

Books for Reference:

1. Peter Norton, Introduction to Computers,6e, (Indian Adapted Edition)
2. B Forouzan, Introduction to data communication and networking

Marks including choice:

Unit	Marks
I	5
II	10
III	10
IV	5

Model Question Papers

Model Question Paper
1B01CSC Introduction to C Programming

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. What are the advantages of arrays?
2. Define the term algorithm
3. Explain the purpose of getchar() function
4. What is source code?
5. What is a keyword?
6. Define the term string.

Part B: Short Essay

Answer any 6 questions **(6 x 2 = 12 Marks)**

7. Which function is used to read a line of text in C?
8. Write notes on limitations of flowchart
9. Explain switch statement in C.
10. Explain the working of increment Operator with an example
11. Explain go-to statement in detail
12. Explain the basic structure of C language.
13. Explain working of strcmp() function.
14. How do you initialize an array in C? explain with suitable examples

Part C: Essay

Answer any 4 questions **(4 x 3 = 12 Marks)**

15. Explain benefits of flowchart.
16. Write notes on conditional operator with an example program.
17. Write a program to perform matrix addition.
18. Write a program to print prime numbers within range.
19. Explain the difference between while and do-while loop in detail.
20. Write algorithm to find the largest number among three numbers.

Part D: Long Essay

Answer any 2 questions **(2 x 5 = 10 Marks)**

21. Write an algorithm and flowchart to swap two Numbers without using temporary variable.
22. Write detailed note on data types in C language.
23. Explain about the looping statements in C.
24. Explain string-handling functions in detail.

Model Question Paper
3B04CSC Data Structures

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. Define Data Structure.
2. What do you mean by Deque?
3. Full Binary Tree – Define.
4. Define Adjacency Matrix.
5. What is ADT?
6. Write the complexity of Bubble sort.

Part B: Short Essay

Answer any 6 questions **(6 x 2 = 12 Marks)**

7. Write a short note on polynomial representation using arrays.
8. Describe the advantages of Two-way list.
9. Write a short note on Post Fix expression.
10. Write a short note on computer representation of general trees.
11. Explain about sequential representation of graphs.
12. Define and explain - algorithms.
13. Differentiate Data Structure and Abstract Data type.
14. Write a short note on linear search.

Part C: Essay

Answer any 4 questions **(4 x 3 = 12 Marks)**

15. Explain push operation in stack with the support of example.
16. Write a detailed note on representation of linked list in memory.
17. Differentiate Complete Binary Tree and Extended Binary Tree.
18. How can I insert an item into a graph? Explain.
19. Explain about measuring of running time of a program.
20. Sort the following data set using selection sort – 10,5,8,2,12,6.

Part D: Long Essay

Answer any 2 questions **(2 x 5 = 10 Marks)**

21. Write in detail about Queue Data Structure.
22. Describe Binary Search tree in detail.
23. Explain the functioning of BFS algorithm with the support of example.
24. Write a detailed note on insertion sort algorithm and explain with example.

Model Question Paper
5B08CSC Web Technology

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. Describe the difference between client-side programming and server-side programming.
2. Give the syntax to embed JavaScript code into the web document.
3. How can we add comments to a web document?
4. What is the importance of PHP?
5. What is Ajax?
6. Define DOM.

Part B: Short Essay

Answer any 6 questions **(6 x 2 = 12 Marks)**

7. Explain any two mouse events.
8. Write a note on WWW.
9. What are the different types of heading available in HTML5?
10. What is meant by page structure element?
11. What are the different parts of a URL?
12. What is the function of AJAX?
13. What are the arithmetic operators used in JavaScript?
14. Write a short note on string object in JavaScript.

Part C: Essay

Answer any 4 questions **(4 x 3 = 12 Marks)**

15. What are the types of data used in PHP?
16. What is meant by dialog boxes? Explain with various types of dialog boxes.
17. What are the different types of lists possible in HTML 5?
18. What are the different types of web hosting?
19. Differentiate between traditional Web Applications and Ajax Applications
20. How can we insert an image into your web page?

Part D: Long Essay

Answer any 2 questions **(2 x 5 = 10 Marks)**

21. Explain forms and various tags associated with it.
22. What is recursion? How is it implemented in JavaScript?
23. Define array. Explain the declaration and usage of arrays in JavaScript with example.
24. How can we process forms using PHP? Explain in detail

Model Question Paper
5B09CSC Java Programming

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. Define Byte code.
2. What do you mean by Auto boxing?
3. Define DMD.
4. Define this keyword.
5. What is chained exception?
6. Define Applet.

Part B: Short Essay

Answer any 6 questions **(6 x 2 = 12 Marks)**

7. Write a short note on short circuit operators in java.
8. Describe the advantages of arrays in java.
9. Write a short note on static method.
10. Explain the uses of super keyword.
11. Briefly explain exception handling in Java.
12. Explain labeled break and labeled continue.
13. What is synchronization in Java?
14. Explain two ways to create threads.

Part C: Essay

Answer any 4 questions **(4 x 3 = 12 Marks)**

15. Explain three uses of final keyword.
16. With an example explain DMD.
17. Write a Java program to print the elements of an integer array with recursion.
18. How to create user-defined packages in Java?
19. Explain bitwise operators.
20. Distinguish abstract class and interfaces in Java.

Part D: Long Essay

Answer any 2 questions **(2 x 5 = 10 Marks)**

21. Write in detail of fundamental Data types.
22. Describe packages and interfaces.
23. Explain applet skeleton and applet tags.
24. Write an applet program to draw a string when an awt Button is pressed.

Model Question Paper
5B10CSC Computation Using Python

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. Give syntax for function definition in python.
2. What are built-in attribute methods.
3. What is the purpose of zeros function in numpy module?
4. Explain the use of linspace function in numpy with an example?
5. What is meant by widget in Tkinter?
6. Give syntax for connecting to a database in python.

Part B: Short Essay

Answer any 6 questions

(6 x 2 = 12 Marks)

7. What are the different methods to run python?
8. What is the difference between mutable and immutable objects in python?
9. How a module can be created? Give an example.
10. Write a recursive function in python to find the nth Fibonacci number and use it to generate a Fibonacci series of required numbers.
11. Explain about built-in exceptions in python.
12. How a class is defined? Explain with an example.
13. Explain 2 different methods for changing the shape of an array.
14. Explain about message widget.

Part C: Essay

Answer any 4 questions

(4 x 3 = 12 Marks)

15. Explain about sets in python.
16. Explain about branching statements in python.
17. How python can be used to write in to a file? Explain with an example.
18. Explain how operator overloading can be done in python with an example.
19. Explain how transaction control can be done in python.
20. Explain about pack layout manger.

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

21. Explain in detail about lists and dictionaries in python.
22. Explain about exception handling in python.
23. What are the object-oriented programming features of python?
24. Explain about 5 widgets in Tkinter.

Model Question Paper
5B11CSC-A Algorithm Designing

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. Define divide and Conquer method.
2. What is partitioning.
3. Define spanning tree.
4. What do you mean by job sequencing with deadlines problem?
5. Define path.
6. Write about Hamiltonian Cycle.

Part B: Short Essay

Answer any 6 questions

(6 x 2 = 12 Marks)

7. How Binary Search is a Divide and Conquer method algorithm?
8. Discuss the performance of Quick sort algorithm.
9. Define greedy method.
10. What do you mean by single source shortest path?
11. What is 0/1 knapsack.
12. Describe all pairs shortest path.
13. What is 8 queens' problem.
14. Write a short note on back tracking.

Part C: Essay

Answer any 4 questions

(4 x 3 = 12 Marks)

15. Explain Binary Search in terms of divide and conquer.
16. Do merge sort in following data set: 34,78,26,5,92,4,71,8
17. Explain knapsack problem.
18. What is single source shortest path.
19. Write a note on dynamic programming.
20. Explain sum of subsets problem.

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

21. Explain Strassen's Matrix Multiplication Algorithm.
22. Describe Prim's algorithm with the support of an example.
23. Write a detailed note on multistage graph.
24. Explain graph coloring problem in detail.

Model Question Paper
6B12CSC Data Communication and Computer Networking

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. What is meant by network topology?
2. Give examples for network hardware.
3. What is bit stuffing.
4. Mention 2 services provided by network layer.
5. What is a LAN?
6. What is the need of flow control?

Part B: Short Essay

Answer any 6 questions

(6 x 2 = 12 Marks)

7. What are the design issues of network layer?
8. What is meant by congestion?
9. List the file transfer protocols.
10. What is the need of error control?
11. What is meant by character stuffing?
12. Explain simplex transmission.
13. What is meant by parallel transmission?
14. What is service point addressing?

Part C: Essay

Answer any 4 questions

(4 x 3 = 12 Marks)

15. Compare between TCP and UDP.
16. Explain flow-based routing.
17. Explain Framing.
18. What are the functions of presentation layer?
19. Briefly explain unicast, multicast and broadcast.
20. Explain about leaky bucket algorithm.

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

21. Explain ISO-OSI reference model.
22. List and explain elementary protocols used in DLL.
23. Explain different types of routing.
24. Explain the various transmission media.

Model Question Paper
6B13CSC Compiler Design

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. What are compiler construction tools?
2. What is a symbol table?
3. Define preprocessor.
4. What is meant by instruction cost in code generation?
5. What is activation record?
6. What is basic block?

Part B: Short Essay

Answer any 6 questions

(6 x 2 = 12 Marks)

7. Define compiler.
8. What are the phases of analyzing a source program?
9. What is the role of lexical analyzer in compiler?
10. Define tokens. Give example.
11. What is syntax error? Give example.
12. Write a short note operator precedence parsing.
13. What are the structure preserving transformations?
14. Write a short note on peephole optimization?

Part C: Essay

Answer any 4 questions

(4 x 3 = 12 Marks)

15. What is meant by semantic analysis?
16. Define regular expression with an example.
17. Define DFA.
18. Briefly explain the working of a parser.
19. Explain ambiguity of grammar.
20. What are the different types of intermediate representation?

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

21. Explain top down parsing in detail.
22. Explain lexical analyzer.
23. Explain the phases of a compiler.
24. Explain code optimization.

Model Question Paper
6B15CSC-B Data Mining

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. Define Data Warehouse.
2. List the distinct features of OLAP and OLTP.
3. List out the major tasks done in Data Preprocessing.
4. What is Data Integration?
5. What is a Decision Tree?
6. List out the stages of KDD.

Part B: Short Essay

Answer any 6 questions

(6 x 2 = 12 Marks)

7. What is CLARANS?
8. How Data Warehouse differ from Heterogeneous Database Management System?
9. Explain about different OLAP operations
10. What is Multi-Dimensional data model. Give example.
11. Why we need Data transformation. Mention the ways by which data can be transformed.
12. What is Categorical Clustering?
13. What is Clustering?
14. What is the need of Data Preprocessing?

Part C: Essay

Answer any 4 questions

(4 x 3 = 12 Marks)

15. Explain about Data Warehouse Architecture.
16. Explain Apriori algorithm.
17. Differentiate CLARA and CLARANS.
18. Explain the working of K-Means algorithm.
19. Discuss in detail about the concept of Spatial Data Mining
20. Discuss about the Decision Tree Construction Principles.

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

21. Explain in detail about Partitioned Algorithms.
22. Explain in detail about Data Preprocessing.
23. Discuss about
    a. FP Tree Growth Algorithms
    b. Data Warehouse Backend Process
24. Explain about Density-Based Algorithms and STIRR.

Model Question Paper
1C01CSC Introduction to Computers and Programming

Time: 3 Hours **Max. Marks: 32**

Part A: Short Answer

Answer all questions **(5 x 1 = 5 Marks)**

1. What is the function of BIOS?
2. Give two types of secondary memory.
3. Find the 2's complement of 10110011_2.
4. What is meant by open source software?
5. What is a Compiler?

Part B: Short Essay

Answer any 4 questions

(4 x 2 = 8 Marks)

6. Write short note about ALU.
7. Explain about SRAM.
8. Explain about ASCII code.
9. What is BCD? Explain with an example?
10. What is an algorithm? Explain with an example.
11. What are the characteristics of a good program?

Part C: Essay

Answer any 3 questions

(3 x 3 = 9 Marks)

12. Explain about different types of ROM.
13. What are the characteristics of a computer?
14. Convert the following numbers as indicated.
    - **a.** 234_{10} to binary
    - **b.** 110011.101_2 to decimal
    - **c.** 1245_8 to hexadecimal
15. What are the uses of computer networks?
16. Explain about program development life cycle?

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

17. Explain about basic hardware components of a computer system with a diagram.
18. Explain about different number systems with examples.
19. Explain about functions of an operating system.
20. Explain about different program control structures.

Model Question Paper
2C02CSC Programming in C

Time: 3 Hours **Max. Marks: 32**

Part A: Short Answer

Answer all questions **(5 x 1 = 5 Marks)**

1. What is a keyword? Give an example.
2. What is a type declaration instruction in C?
3. What is an escape sequence character? Give an example.
4. Explain about library function.
5. Explain how a one-dimensional array can be declared with an example.

Part B: Short Essay

Answer any 4 questions

(4 x 2 = 8 Marks)

6. Write a C program to find the greatest of three numbers entered through the keyboard.
7. Explain about break and continue statements with an example.
8. Write a recursive function to find the factorial of a number.
9. What are the advantages of using functions in a program?
10. Write a short note about two-dimensional arrays.
11. What are C Preprocessors? Give examples.

Part C: Essay

Answer any 3 questions

(3 x 3 = 9 Marks)

12. Explain about different types of constants in C.
13. Differentiate between while and do-while statements with an example.
14. Explain about switch statement in C with an example.
15. Write a short note about pointers in C.
16. Explain about different methods for passing parameter to functions in C.

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

17. Explain about different types of operators in C.
18. Explain about different forms of if statement.
19. Explain about different storage classes in C.
20. What are strings? Explain in detail about standard string handling functions in C.

Model Question Paper
3C03CSC Web Technology with Database Management System

Time: 3 Hours **Max. Marks: 32**

Part A: Short Answer

Answer all questions **(5 x 1 = 5 Marks)**

1. How hyperlinks can be created in a HTML page?
2. What are the heading tags in HTML?
3. What is meant by database schema?
4. How tuples of a select query can be ordered based on an attribute?
5. What is the purpose of GET method in an HTML form?

Part B: Short Essay

Answer any 4 questions

(4 x 2 = 8 Marks)

6. Explain about formatting tags in HTML.
7. Explain about any 2 semantic elements in HTML5.
8. Explain about inline, internal and external css styling.
9. Write short note about datalist tag in HTML with an example.
10. Explain about CREATE TABLE statement with an example.
11. Explain how user defined functions are created in php with an example.

Part C: Essay

Answer any 3 questions

(3 x 3 = 9 Marks)

12. Explain about different lists in HTML.
13. Explain how tables can be created in HTML with an example.
14. Explain about HTML5 form validation techniques.
15. Explain about different aggregate functions in SQL.
16. Explain briefly about relational data model.

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

17. Explain in detail about different form elements, input types and attributes.
18. Explain in detail about advantages of DBMS.
19. Explain about different types of joins in SQL.
20. Design an HTML page which contains a form for accepting basic student details. Explain how this form data can be stored in a database table using php.

Model Question Paper
4C04CSC Computation Using Python

Time: 3 Hours **Max. Marks: 32**

Part A: Short Answer

Answer all questions **(5 x 1 = 5 Marks)**

1. Explain about input function in python.
2. Give syntax for function definition in python.
3. What is meant by exception? Give an example.
4. What is the purpose of zeros function in numpy module?
5. Explain the use of linspace function in numpy with an example?

Part B: Short Essay

Answer any 4 questions

(4 x 2 = 8 Marks)

6. What are the different methods to run python?
7. What is the difference between mutable and immutable objects in python?
8. Explain for loop in python with an example.
9. Explain about any two functions in math module.
10. How a class is defined? Explain with an example.
11. Explain 2 different methods for changing the shape of an array.

Part C: Essay

Answer any 3 questions

(3 x 3 = 9 Marks)

12. Explain about sets in python.
13. How python can be used to write in to a file? Explain with an example.
14. Explain about different types of function arguments in python.
15. What is operator overloading? Explain with an example.
16. Write a python program to plot the mathematical function x^2.

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

17. Explain in detail about lists and dictionaries in python.
18. Explain about exception handling in python.
19. What are the object-oriented programming features of python?
20. Explain about different data visualization techniques in python. Write python program for plotting the mathematical function sin x.

Model Question Paper
5D01CSC Programming in C

Time: 2 Hrs **Max Marks: 20**

Part A (Short Answer)

Answer All Questions **(6 x 1 = 6)**

1. What is keyword?
2. What is the use of getchar()?
3. Define array.
4. What is function prototype?
5. What is pointer?
6. What is structure?

Part B (Short Essay)

Answer Any FOUR Questions **(4 x 2 = 8)**

7. Explain fundamental data types.
8. Explain about arithmetic and relational operators.
9. Write the syntax of if-else statement.
10. Explain recursion.
11. Explain about for loop?
12. How structure variables are initialized and accessed? Explain with example.

Part C (Essay)

Answer Any ONE Questions **(1 x 6 = 6)**

13. Explain looping statements in C with example.
14. Explain any four string handling functions in C with example.

Model Question Paper
5D02CSC Web Technology

Time: 2 Hrs **Max Marks: 20**

Part A (Short Answer)

Answer All Questions **(6 x 1 = 6)**

1. How images can be added in an HTML page?
2. What is the use of <a> tag in HTML?
3. What are the different heading tags in HTML?
4. Give 2 examples for semantic tags.
5. What is the use of password input in an HTML form?
6. What is a checkbox in an HTML form?

Part B (Short Essay)

Answer Any FOUR Questions **(4 x 2 = 8)**

7. Explain about lists in HTML.
8. Explain about structure of an HTML document.
9. Explain about HTML form validation.
10. Explain about inline, internal and external css styling.
11. Explain about data list and list attribute with an example.
12. Explain about confirm and prompt boxes in java script.

Part C (Essay)

Answer Any ONE Questions **(1 x 6 = 6)**

13. What is meant by Table? What are the tags used for table creation? What are the different attributes? Illustrate with an example.
14. Explain different types of operators in java script.

Model Question Paper
5D03CSC Database Management System

Time: 2 Hrs **Max Marks: 20**

Part A (Short Answer)

Answer All Questions **(6 x 1 = 6)**

1. What is tuple?
2. Define primary key.
3. What are DDL commands?
4. What is sequence?
5. What is the use of delete command?
6. List the arithmetic operators in SQL.

Part B (Short Essay)

Answer Any FOUR Questions **(4 x 2 = 8)**

7. Explain the advantages of DBMS.
8. Write a note on relational model.
9. Explain the functions of DBA.
10. Explain update command.
11. Explain about insert command.
12. Explain about data types in SQL.

Part C (Essay)

Answer Any ONE Questions **(1 x 6 = 6)**

13. Explain about relational algebra operations.
14. Explain various SQL functions with suitable examples.

Model Question Paper
5D04CSC Fundamentals of Computers and Programming

Time: 2 Hrs **Max Marks: 20**

Part A (Short Answer)

Answer All Questions **(6 x 1 = 6)**

1. What is gray code?
2. What is ASCII?
3. What are secondary storage devices?
4. What is flowchart?
5. Define algorithm.
6. What is source code?

Part B (Short Essay)

Answer Any FOUR Questions **(4 x 2 = 8)**

7. Explain the function of CPU.
8. Explain BCD.
9. Converts the decimal number 256 to binary.
10. Explain transmission modes.
11. Differentiate compiler and interpreter.
12. Explain the characteristics of a good program.

Part C (Essay)

Answer Any ONE Questions **(1 x 6 = 6)**

13. Explain the generations of a computer.
14. Explain network topologies.

Model Question Paper
5D05CSC Introduction to Python Programming

Time: 2 Hrs **Max Marks: 20**

Part A (Short Answer)

Answer All Questions **(6 x 1 = 6)**

1. Explain about input function in python.
2. Give syntax for function definition in python.
3. What is meant by exception? Give an example.
4. What is the function of zeros function in numpy module?
5. Explain plot function.
6. Explain the use of linspace function in numpy with an example.

Part B (Short Essay)

Answer Any FOUR Questions **(4 x 2 = 8)**

7. What are the different methods to run python?
8. What is the difference between mutable and immutable objects in python?
9. Explain for loop in python with an example.
10. Explain about any two functions in math module.
11. Explain 2 different methods for changing the shape of an array.
12. Explain about any 2 operators in python.

Part C (Essay)

Answer Any ONE Questions **(1 x 6 = 6)**

13. Explain in detail about lists and dictionaries in python.
14. Explain about exception handling in python.

KANNUR UNIVERSITY
(Abstract)

Bachelor of Business Administration (BBA) Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12392/2019 Dated, Civil Station P.O.,22 .06. 2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated,10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.
4. The Minutes of the Meeting of the Board of Studies in Management Studies (UG) held on 07.06.2019
5. Syllabus of BBA Programme , Submitted by the Chairperson, Board of Studies in Management Studies (UG), dated , 13.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies ,Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Management Studies (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core,

Complementary Elective & Generic Elective Course of BBA Programme to be implemented with effect from 2019 Admission.

5. Further, as per paper read (5) above, the Chairperson, Board of Studies in Management Studies (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of BBA Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Papers (Core/Complementary Elective/Generic Elective Course) of BBA Programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Papers of BBA Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering BBA Programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Management Studies (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, Management Studies (UG)

BACHELOR OF BUSINESS ADMINISTRATION PROGRAMME
(BBA)

CHOICE BASED CREDITAND SEMESTER SYSTEM
(CBCSS)
Under
Outcome Based Education
(OBE)

(2019 ADMISSION ONWARDS)

Kannur University

Vision and Mission Statement*

Proposed Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady taluk of Wayanad Revenue District.

Proposed Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

Kannur University
Programme Outcomes

PO 1.Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

Preface

The BBA Programme aims at equipping the students with new ideas and changes in the sphere of business and management. It is imperative to update the syllabus to impart the latest developments in business world and changing the view of our students about the global changes.

In the light of UGC guidelines and Higher Education Council’s directives, the programme curriculum has been revised to meet the requirements of the modern time. The present revision aims at familiarizing students with latest practices in management in the area of finance, human resource development and marketing. It also aims at acquiring skills in accounting and quantitative techniques in the areas of decision making and management, and building entrepreneurial spirit and competencies, and develops research aptitude.

Dr. BINDU K
Chairperson
Board of Management Studies UG

BACHELOR OF BUSINESS ADMINISTRATION PROGRAMME (BBA)

Programme Specific Outcome
of
Bachelor of Business Administration Programme

PSO 1:
Gain knowledge and skills in the areas of Management principles and practices, finance, human resource management and marketing

PSO 2:
Acquire knowledge in accounting principles and practices and its application in real business settings

PSO 3:
Apply concepts, theories, tools and techniques of statistics, information techniques, economics and numerical skills for decision making

PSO 4:
Build entrepreneurial spirit, develop research attitude and entrepreneurial competencies and managerial abilities

INDEX

KANNUR UNIVERSITY

BBA PROGRAMME

Credit and courses

Sl no	Category of course	Number of courses	Credits
1	English Common course(ECC)	2×4 =8 2×3=6	14
2	Additional Common course(ACC)	2×4=8	8
3	General Awareness Course Ability Enhancement Course (AEC) Skill Enhancement Course (SEC)	 2×4=8 2×4=8	16
4	Core course(CC) Discipline Specific Elective course (DSEC)		64
5	Complementary elective Course(CEC)	4×4=16	16
6	Generic Elective Course(GEC)	1×2=2	2
Total			**120**

Semester	**Course Title***	Type of Course	**Credits**	**Hours per week**	**Total Credits**	**Total Hours**
I	English Common Course I	ECC	4	5	22	25
	English Common Course II	ECC	3	4		
	Additional Common Course I	ACC	4	5		
	Core Course I. Principles and Practices of Management	CC	3	3		
	Complementary Elective Course 1 Statistics for business decisions	CEC	4	4		
	Complementary Elective Course 2 Managerial Economics	CEC	4	4		
II	English Common Course III	ECC	4	5	21	25
	English Common Course IV	ECC	3	4		
	Additional Common Course II	ACC	4	5		
	Core Course 2 Business Environment	CC	2	3		
	Core Course 3 Entrepreneurship Development	CC	4	4		
	Complementary Elective Course 3 Quantitative Technique for Business Decisions	CEC	4	4		

III	Skill Enhancement Course I Numerical skills	SEC	4	5	20	25
	Ability Enhancement Course I Personality development and communication skills	AEC	4	4		
	Core Course 4 Financial Accounting	CC	4	6		
	Core Course 5 Marketing Management	CC	4	5		
	Complementary Elective Course 4 Legal Aspects Business	CEC	4	5		
IV	Core Course 6 Human Resource Management	CC	4	6	21	25
	Core Course 7 Financial Management	CC	4	5		
	Core Course 8 Operations management	CC	4	5		
	Core Course 9 Industrial Visit and Report	DSEC	1	0		
	Skill Enhancement Course II IT Tools for business	SEC	4	5		
	Ability Enhancement Course II Environmental studies	AEC	4	4		
V	Core Course 10 Business Research Methods	CC	4	5	18	25
	Core Course 11 Accounting for management	CC	4	6		
	Core Course 12 Elective I	DSE	4	6		
	Core course 13 Elective II	DSE	4	6		
	Generic Elective Course	GEC	2	2		
VI	Core Course 14 Organisation Behaviour	CC	4	6	18	25
	Core Course 15 Banking Theory and Practice	CC	4	5		
	Core Course 16 Project Report and viva voce	CC	2	2		
	Core Course 17 Elective III	DSE	4	6		
	Core Course 18 Elective IV	DSE	4	6		
Total					120	150

PART A:
BBA CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1B01BBA	Core Course I. Principles And Practice Of Management	I	3	3	3
2B02BBA	Core Course 2 Business Environment	II	3	2	3
2B03BBA	Core Course 3 Entrepreneurship Development	II	4	4	3
3B04BBA	Core Course 4 Financial Accounting	III	6	4	3
3B05BBA	Core Course 5 Marketing Management	III	5	4	3
4B06BBA	Core Course 6 Human Resource Management	IV	6	4	3
4B07BBA	Core Course 7 Financial Management	IV	5	4	3
4B08BBA	Core Course 8 Operations Management	IV	5	4	3
4B09BBA	Core Course 9 Industrial Visit And Report	IV	0	1	-
5B10BBA	Core Course 10 Business Research Methods	V	5	4	3
5B11BBA	Core Course 11 Accounting For Management	V	6	4	3
5B12BBA	Core 12 Elective I	V	6	4	3
5B13BBA	Core 13 Elective II	V	6	4	3
6B14 BBA	Core Course 14 Organisation Behaviour	VI	6	4	3
6B15BBA	Core Course 15 Banking Theory and Practice	VI	5	4	3
6B16BBA	Core Course 16 Project Report and Viva Voce Examination	VI	2	2	-
6B17BBA	Core Course 17 Elective III	VI	6	4	3
6B18BBA	Core Course 18 Elective IV	VI	6	4	3

DISCIPLINE SPECIFIC ELECTIVE COURSES

1 FINANCE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Advanced Financial Management	V	6	4	3
5B13BBA	Income tax law and Practice	V	6	4	3
6B17BBA	Insurance and Risk management	VI	6	4	3
6B18BBA	Stock And Commodity Markets	VI	6	4	3

II HUMAN RESOURCE MANAGEMENT

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Human Resource Development	V	6	4	3
5B13BBA	Performance and Compensation Management	V	6	4	3
6B17BBA	Counselling and negotiation skills for managers	VI	6	4	3
6B18BBA	Organisational Change and Development	VI	6	4	3

III MARKETING

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B12BBA	Consumer Behaviour	V	6	4	3
5B13BBA	Advertising and Brand Management	V	6	4	3
6B17BBA	Logistics Management	VI	6	4	3
6B18BBA	Retail Management	VI	6	4	3

PART B

GENERAL AWARENESS COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
3A11BBA	Skill Enhancement Course I Numerical Skills	III	5	4	3
3A12BBA	Ability Enhancement Course I Personality Development and Communication Skills	III	4	4	3
4A13BBA	Skill Enhancement Course II IT Tools For Business	IV	Theory 3 Practical 2	4	2
4A14BBA	Ability Enhancement Course II Environmental Studies	IV	4	4	3

PART C

COMPLEMENTARY ELECTIVE COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
1C01BBA	Statistics for business decisions	I	4	4	3
1C02BBA	Managerial Economics	I	4	4	3
2C03BBA	Quantitative Techniques For Business Decisions	II	4	4	3
3C04BBA	Legal Aspects Of Business	III	5	4	3

GENERIC ELECTIVE COURSE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5D01BBA	Customer Relationship Management	V	2	2	2
5D02BBA	Service Marketing	V	2	2	2
5D03BBA	E- Commerce	V	2	2	2
5D04BBA	Event Management	V	2	2	2
5D05BBA	Disaster Management	V	2	2	2

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4 (40 MARKS)
INTERNAL	1(10 MARKS)

*20 marks for theory and 20 marks for practical for courses having practical (IT in business)

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT1 INTERNAL TEST	2	TWO TESTS (6 MARKS)
COMPONENT 2 ASSINGMENT/SEMINAR/VIVA	1	INDIVIDUAL OR GROUP (4 MARKS)

EVALUATION FOR GENERIC ELECTIVE

ASSESSMENT	WEIGHTAGE
EXTERNAL	4 (20 MARKS)
INTERNAL	1(5 MARKS)

CORE COURSE I : PRINCIPLES AND PRACTICES OF MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1B01BBA	3	3	3

COURSE OUTCOME

CO 1:Acquaint with the basics of management.

CO2: Understand the process and functions of management.

CO3: Familiarize the students with the current management practices.

Co4: Develops administrative skills

Module I:Management: Definition, Nature, Purpose, Scope, Features, levels and functions-Evolution of Management Thoughts- classical, neo classical and modern, Contributions made by Taylor, Fayol , and Maslow.

(**20 Hrs)**

Module II: Planning and organising: Planning-Meaning, Nature, characteristics, types, steps in Planning - Decision making Process – types of Decisions. Organising - Meaning, Principles, Delegation of Authority- centralisation and decentralisation-meaning and differences

(20 Hrs)

Module III: Staffing and directing: Staffing- meaning, process. Directing – Meaning, Nature, Principles, Importance, Elements .Controlling- meaning, process-,control techniques-Need for co-ordination.

(20 Hrs)

Module IV: Trends in Management -

Work life balance-meaning, components (self management, time management, stress management).BPO – KPO – meaning, importance and differences

(**12 Hrs)**

Books for Reference:

1. Principles of Management LM Prasad, Himalaya

2. Harold Koontz & Heinz Weihrich, Essentials of Management, Tata McGraw Hill, New Delhi

3. P.C.Tripathy And P.N.Reddy, Principles of Management, Tata McGraw Hill, New Delhi
4. Richerd L Daft, Principles of Management, Cengage Learning, India Edition, New Delhi.
5. T.Ramasami, Principles of Management, Himalaya Publications, Mumbai.
6. S.P.Robbins, David A Decenzo and Mary Coulter, Fundamentals of Management, Pearson Education, New Delhi.

Marks including choice:

Module	Marks
I	17
II	17
III	16
IV	10
Total	60

SEMESTER I
COMPLEMENTARY ELECTIVE COURSE I: STATISTICS FOR BUSINESS DECISIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1C01BBA	4	4	3

COURSE OUTCOMES

CO1: Understand the importance and relevance of statistics, primary data, secondary data and the statistical technique as applicable to business

CO2: Classify, tabulate and represent the statistical data in appropriate manner using statistical methods

CO3: Analysis trend and seasonality in a time series data

CO4: Construct index numbers and enable to compare the price movements of commodities over different time periods.

CO5: Identify the correlation between variables

C06: Problem solving and fit the regression line which enable to draw conclusion about data distribution.

Module I

Introduction -Meaning and Definition of Statistics-Functions-scope-uses-advantages and limitations-Collection of data-types of data - Primary data, Secondary data, Classification and tabulation of statistical Data- Diagrammatic and graphical representation of data

(20 Hrs)

Module II

Time series- Components- Methods of studying secular trend- Free hand curves-Semi Average Method- Moving Average Method-Method Least Squares

(15 Hrs)

Module III

Index Numbers- meaning and definition-uses-Problems in the construction of Index numbers- Types of Index numbers- Methods of construction of Index numbers- Tests- Fixed base and chain base methods-Consumer price index: uses and methods of construction **(17Hrs)**

Module IV

Correlation and Regression Analysis-meaning- definition-Methods of correlation-Karlpearson’s coefficient of correlation –Spearman’s Rank correlation- concurrent Deviation method-probable error-Simple Regression Analysis-regression line-regression equations-algebraic methods and their applications in business. **(20Hrs)**

References

Statistical Methods- S.P.Gupta

Business Statistics- J.K Sharma

Business Statistics- P.R.Vital

Fundamentals of Mathematics and Statistics by V.K.Kapoor and S.C Gupta

Marks including choice:

Module	Marks
I	17
II	17
III	16
IV	10
Total	60

SEMESTER I
COMPLEMENTARY ELECTIVE COURSE II: MANAGERIAL ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1C02BBA	4	4	3

COURSE OUTCOMES

CO1. Understand basic managerial economic concepts
CO2. Understands economics and related disciplines and relationships
CO3. Apply economic analysis in the formulation of business policies
CO4. Use economic reasoning to problems of business

Module I

Introduction to Managerial Economics: Concept, meaning, scope. Managerial economics and other disciplines. Basic economic concepts in decision making.

(20 hours)

Module II

Demand Analysis:- Law of demand, Determinants of demand, Price elasticity of demand, Income elasticity of demand, cross elasticity of demand, uses of elasticity for analyzing demand.

(20 hours)

Module III

Cost Analysis: Cost concepts and determinants of cost, cost output relationship in short and long period. Supply**:** Introduction to supply and supply curves.

(20 hours)

Module IV

Pricing Analysis: Price determination under perfect, imperfect competition and monopoly. Types of pricing methods **(12 hours)**

References:

1. Managerial Economics: Analysis, Problems and Cases, P.L. Mehta.

2. Managerial Economics: Varshney and Maheshwari.

3. Managerial Economics: D. Salvatore.

4. Managerial Economics: Pearson and Lewis

5. Managerial Economics: G.S. Gupta

Marks including choice:

Module	Marks
I	17
II	17
III	16
IV	10
Total	60

II SEMESTER

CORE COURSE II : BUSINESS ENVIRONMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B02BBA	3	2	3

COURSE OUTCOMES

CO 1: Acquire in-depth knowledge about different environment in business climate.

CO2: Understand the minor and major factors affecting the business in various streams

CO3: Familiarize the role of socio-cultural factors on development of economy and business.

CO4: Develop good business policies.

Module I: Business Environment – Concept of BE, Components of BE , Importance of BE , Environmental Analysis , Benefits and Limitations of Environmental Analysis.

(8 Hrs)

Module II: Social and Cultural Environment – Interface between Business and Culture – Social Responsibilities of business – Political Environment – Economic Role of Government – Legal Environment – Constitutional Environment.

(14 Hrs)

Module **III:** Economic environment – Nature of Economic Environment – New Economic Policy 1991 –Privatization – Nature of Privatization – Objectives of Privatization. Disinvestment – Limitations of disinvestment – Public sector – Objectives of Public Sector.

(18 Hrs)

Module IV: Ecological Environment – Ecology and Business – Industrial Pollution – Global Environment –Globalization - MNC s – Problem with MNCs – Global Entry Strategies – Measures to promote Globalization – Challenges of Globalization to Indian Industry.

(14 Hrs)

Books for Reference:

1. Business Environment: C.B.Gupta

2. Business Environment: Francis Cherunilam

3. Business Environment: Dr. P.K.Ghosh

4. Essentials of Business Environment

Marks including choice:

Unit	Marks
I	8
II	16
III	20
IV	16
Total	60

SEMESTER II

COMPLEMENTARY ELECTIVE COURSE III :QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2C03BBA	4	4	3

COURSE OUTCOME

CO1. Understands concepts of quantitative techniques

CO2. Develops analytical thinking and logical reasoning for effective decision making

CO3. Apply probability theories in real life situations

CO4. Understands theoretical distributions and hypothesis testing and its applications in live situations

Module I:

Quantitative Techniques-Introduction-Meaning and definition-Application of Quantitative Techniques in business-Limitations **(12 hours)**

Module II:

Probability -Concept of Probability-Meaning and definition-Approaches to probability-Theorems of probability-Addition theorem-Multiplication theorem-Conditional probability-Inverse probability-Baye's theorem. **(15 hours)**

Module III:

Theoretical Distribution - Binomial distribution - Basic assumptions and characteristics - Fitting of binomial distribution - Poisson distribution - characteristics - Fitting of Poisson distribution - Normal distribution - features and properties - Standard normal curve.

(20 hours)

Module IV:

Statistical Inference - Testing of hypothesis – Procedure –Null & Alternate hypothesis - Level of significance – Critical region- Degrees of freedom- Errors in testing- Two tail test and One tail test Parametric tests & Non parametric tests (only theory) **(25 hours)**

REFERENCE

1. S.P. Gupta, Statistical Methods, Sultan Chand & Co.
2. S.C. Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics, S. Chand & Co.
3. B.L. Agarwal, Basic Statistics, New Age International
4. Quantitative Techniques in Management : Vohra
5. R. K. Ghosh, S. Saha, Business Mathematics & Statistics, New Central Book Agency

Marks including choice:

Module	Marks
I	10
II	17
III	20
IV	13
Total	60

SEMESTER II
CORE COURSE III : ENTREPRENEURSHIP DEVELOPMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B03BBA	4	4	3

COURSE OUTCOME

CO 1: Understand different stages of business and create innovative thinkers to take forward new initiatives.

CO2: Acquaint them with the challenges faced by the entrepreneur

CO3: Familiarize the students the entrepreneurship opportunities available in the society.

CO4: Develop the motivation to enhance entrepreneurial competency.

Module I: Introduction: The Entrepreneur: Definition, Emergence of Entrepreneurial Class; Theories of Entrepreneurship; Role of Social Economic Environment; Characteristics of Entrepreneur; Leadership; Risk Taking; Decision Making and Business Planning. **(18 Hrs)**

Module II: Concept of women entrepreneur -problems of women entrepreneur -Promotion of a Venture: Opportunities Analysis; External Environmental Analysis- Economic, Social and Technological; Competitive Factors; Legal Requirements of establishment of a new unit and Rising of Funds; Venture Capital. **(16 Hrs)**

Module III: Entrepreneurial Behaviour: Innovation and entrepreneur; Entrepreneurial Behaviour and psycho-theories, social responsibility. Entrepreneurial Development Programmes (EDP): EDP, its role, relevance and achievements; role of government in organizing EDP's critical evaluation **(20 Hrs)**

Module IV:

Role of entrepreneur: Role of an entrepreneur in economic growth as an innovator, generation of employment opportunities, complimenting and supplementing economic growth, bringing about social stability and balanced regional development of industries:

(18 Hrs)

Books for Reference:

1. Entrepreneurship. : Vasant Desai.

2. Entrepreneurship Development: Taneja& S.L. Gupta.

3. Venture Capital –The Indian Experience: Pandey, I.M.

4. Environment and Entrepreneur Tandon B.C

5. A practical guide to industrial entrepreneurs: Srivastava S.B.

6. Project Preparation, Appraisal, Implementation: Chandra, Prasana

7. Entrepreneurship New Venture Creation; Holt

Marks including choice:

Module	Marks
I	15
II	13
III	17
IV	15
Total	60

III SEMESTER

CORE COURSE IV : FINANCIAL ACCOUNTING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B04BBA	6	4	3

COURSE OUTCOMES

CO1: Understands accounting concepts and principles

CO2: Apply knowledge regarding concepts in the preparation of final accounts of sole traders

CO3: Understands the basic concepts of company, shares and share capital

CO4: Demonstrates skills in preparation of final accounts of companies

Module I: Introduction To Accounting: Meaning and Definition of Accounting, Objectives of Accounting, Accounting Cycle or Process, Branches of Accounting, Functions of Accounting, Users of Accounting, Limitations of Accounting and Generally Accepted Accounting Principles- Accounting Concepts, Principles and Conventions only. **(30 hours)**

Module II: Final accounts of sole trading concern: Preparation of Manufacturing, Trading and Profit and Loss Accounts and Balance Sheets with Adjustments for Outstanding and Prepaid Expenses, Accrued and Unearned incomes, Depreciation, Bad and Doubtful Debts and Closing Stock. **(30 hours)**

Module III: Company accounts: Meaning and Definition of Companies, Characteristics of Companies, Types of Companies, Meaning of Shares and Share Capital, Types of Shares, Accounting Entries for Issue of Shares for Cash, Forfeiture of Shares, and Re-issue of Shares.

(25 Hours)

Module IV: Final accounts of companies: Preparation of Balance Sheet and Statement of Profit and Loss Accounts, Corporate Dividend Tax (CDT), Internal and External Reconstruction- Amalgamation, Merger and Acquisition (Theory Only).

(33 Hours)

Reference

Advanced accounting : SP Jain and KL Narang

Advanced Accounting :Shukla, Grewal

Advanced Accounting: SN Maheswary

Advanced Accounting: BS Raman

Marks Including Choice

Module	Marks
I	15
II	15
III	15
IV	15
Total	60

III SEMESTER

CORE COURSE V: MARKETING MANAGEMENT

SEMESTER	COURSE CODE	HOURS	CREDIT	EXAM HOURS
III	3B05BBA	5	4	3

COURSE OUTCOME

CO 1.Develop knowledge on the concept modern marketing, marketing environment, marketing mix, market segmentation and target marketing.

CO 2. Enhance knowledge on product decision, product mix, product life cycle, pricing strategies and price discrimination

CO 3. Apply the concept of market promotion, market promotion mix and sales promotion techniques in real business situations.

CO 4. Understand the new market realities, direct marketing, online marketing and customer relationship marketing.

CO 5. Identify the key characteristics of customer relationship marketing and common draw back.

CO 6. Develop idea on branding and strategies of branding

CO 7. Acquire skill in preparing advertisement copy very effectively.

Module I: Introduction to Modern Marketing: Definition-Nature and Importance of marketing, evolution of marketing, Marketing environment; Macro and Micro environment, important marketing concepts-selling and marketing-Marketing mix, consumer behaviour, market segmentation; bases for market segmentation; Target Market ;Branding –definition, importance , branding strategies and packaging.

(20 Hours)

Module II: Product Decision: Concept of product; Product Dimension; Concept of product mix, Product line and Product Items; Product mix Dimensions; New product concept and reasons of failure of the new product; Product Life cycle- Concept of pricing; significance of price in marketing; Pricing objectives; Factors affecting price; discounts and rebates; pricing strategies; price discrimination.

(20 Hours)

Module III: Market Promotion : Concept of market promotion; Objectives of Market Promotion; Elements of Market Promotion mix: advertising, personal selling , sales promotion, publicity and public relations; Advertising : functions of advertising; advertisement copy, advertising media; types of advertising media; characteristics of effective media ; ethical aspects of advertising; Personal selling : Concept, Features and Significance; Difference between advertising and personal selling ; functions of a salesman; characteristics of a good salesman; Distribution decision: Physical distribution; channel of distribution; Types of channel distribution; Sales promotion: sales promotion schemes; sample; coupon; price off; premium plan; trade fairs and exhibitions. **(30 Hours)**

Module IV: New Marketing Realities: Direct marketing and online marketing: Concept of Direct and online Marketing; Activities; Benefits and limitations; Green Marketing: Concepts; Need and Importance; Green Marketing efforts and managerial Implications; Customer Relationship Marketing(CRM): Concept and importance; Components of CRM Programme; Concept of e-CRM; Common draw backs of CRM Programme.

(20 Hours)

References:

1. Philip Kotler, Marketing Management- Prentice Hall
2. Stanton, Etzel and Walker, Marketing Management-McGraw Hill
3. R. Saxena, Marketing Management- Tata McGraw Hill
4. Majumdar, Marketing Research
5. Marketing Management : RSN Pillai and Bagavathy
6. Marketing Management : SP Bansal

Marks Including Choice

Module	Marks
I	13
II	13
III	20
IV	14
Total	60

III SEMESTER

SKILL ENHANCEMENT COURSE I: NUMERICAL SKILLS

SEMESTER	COURSE CODE	HOURS	CREDIT	EXAM HOURS
III	**3A11BBA**	**5**	**4**	**3**

COURSE OUTCOMES

CO 1.Understand common numerical methods
CO 2.Apply numerical methods to obtain approximate solutions to mathematical problems
CO 3. Analyses and evaluate the accuracy of common numerical methods
CO 4. Derive numerical methods for various mathematical operations and tasks

Module I: Arithmetic : Average, Mixtures – Ratios and proportions – Computations of interest – Simple interest – Compound interest – effective yield – Future value, present value – Amortization – depreciation – continuous compounding.

(20 Hours)

Module II: Algebra : Real and imaginary numbers – Rational and irrational numbers – Set theory- Union of sets- intersection of sets – Venn diagram – Elements of co – ordinate system, matrices –operational rules – Inverse of a matrix. **(20 Hours)**

Module III: Theory of equations: Meaning, types of equations – simple linear and simultaneous equations (Only two variables) Eliminations and substitution method only. Quadratic equations factorization and formula method ($ax^2+bx+c = 0$ form only) Problems on business application.

(25 Hours)

Module IV: Progression: Arithmetic Progressions, Finding the 'n' th term of an AP and also sum to n terms of AP. Insertion of arithmetic means in given terms of AP and representation of AP. Geometric Progression. Finding the 'n' th term of GP. Insertion of GMs in given GP and also representation of GP. Mathematics of finance simple and compound interest(Simple problems only)

(25 Hours)

References :

1. Applied Numerical analysis – P K Kandasamy, K Thilakavathi, Gunavathi
2. Numerical methods : Gerald
3. Essentials of college mathematics for Business, Economics, life science and social science : Raymond Barnett, Michael Ziegler.
4. Business Mathematics : Padmalochan Hazarika

Marks Including Choice

Module	Marks
I	15
II	15
III	15
IV	15
Total	60

ABILITY ENHANCEMENT COURSE I: PERSONALITY DEVELOPMENT AND COMMUNICATION SKILLS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3A12BBA	4	4	3

COURSE OUTCOMES

CO 1: Understand the 'self' through analysis of one's own strengths, weaknesses, opportunities and threats to face the challenging and competitive world.

CO2: Set new goals specific, measurable, achievable, realisable and time-bounded to reshape the personality and identify the shortcomings to be corrected.

CO3: Develop inter personal skills and problem solving skills.

CO4: Understand the role of body language in effective communication.

CO5: Critically evaluate the need for stress management and experience the essence of different techniques in reducing stress.

CO6: Perform effectively the assigned work to the fullest satisfaction; with utmost concentration and self motivation to achieve success in near future.

Module I: Introduction to Personality Development: Definition of Personality- Human Growth and Behaviour- Importance of Personality Development- Techniques in Personality development a) Self-confidence through SWOC b) Mnemonics c) SMART Goal setting d) Time Management and effective planning. **(15 Hrs)**

Module II: Communication Skills: a) Intra personal communication and types of Body Language b) Inter personal Communication and Relationships c) Leadership Skills d) Team Building and public speaking, Written communication- Basics of Letter writing, memorandum, notice, email, and report writing- Resume writing. **(20 Hrs)**

Module III: Etiquettes and Manners: Social etiquettes, phone etiquettes, Customer interaction etiquette, Dining- Business etiquettes- Professional etiquette tips- Boss Management.

(12 Hrs)

Module IV: Presentation skills: How to face an Interview? - Preparations before, during and after interview, DOs and Donts for interviewee- Group Discussions- problem solving, Creativity and Leadership skills.

(10 Hrs)

Module V: Stress Management:

Concentration and Relaxation exercises: Yoga, Meditation- Need for Work Life Balance- Role of Emotional Intelligence and Spiritual Intelligence in Self Acceptance and Self Growth.

(15 Hrs)

References

1. Personality Development and Communication Skills by S.S. Narula; reprinted 2013.
2. Communicating at Work – Principles and Practices for Business and the Professions by Adler, The McGraw Hill Company, 9th Edition
3. Business Communication and Personality Development by Biswajit Das &IpseetaSatpathy, The Excel Publications, 1st Edition
4. Developing Soft Skills by Robert M. Sherfield, Rhonda J., Patricia J. Moodi; Cornerstone Publications.

5. "The Art of Stress-Free Living" by Sri Sri Ravi Shankar.

5. Winning at Interviews by Edger Thorpe, Showik Thorpe; Pearson Publications, 1st Edition.
6. "How to stop worrying and start living" by Dale Carnegie.
7. Complete Guide to Relieving Stress and Living A Peaceful Life - 2015 Edition by Jen Steifer.

Marks Including Choice

Module	Marks
I	13
II	16
III	10
IV	8
V	13
Total	60

III SEMESTER

COMPLEMENTARY ELECTIVE COURSE 4: LEGAL ASPECTS OF BUSINESS

SEMESTER	COURSE CODE	HOURS	CREDIT	EXAM HOURS
III	3C04BBA	5	4	3

COURSE OUTCOME

CO 1. Understand the conditions and rules that are applicable to a contract and the importance of law in business.

CO 2. Identify the important and relevant documents needed for registering Indian companies.

CO 3. Awareness about the latest amendments in the Indian Companies Act

CO 4. Develop knowledge on the Sale of Goods Act, GST, the application of CGST, SGCT and its challenges and opportunities.

CO 5. Apply the knowledge on consumer protection Act, rights of consumer and dispute redressal agencies in real life situations.

Module I :Indian Contract Act ,1872: Law of contract, Definition of contract, Basic concepts of contract- Valid contract, Void ,voidable and illegal contract, offer, acceptance, consideration, capacity of parties to contract, free consent- coercion, undue influence, misrepresentation, fraud,- breach of contract – remedies of breach of contract. **(20 Hours)**

Module II: Companies Act: Definition of Company, essential features of company, Types of companies - Private Limited Company and Public limited company- Companies Act 2013 (Amendments), Important documents: Memorandum and Articles of Association, Prospectus- Promotion and Incorporation of company- Steps in the formation of company-Share capital of company- Shares, Debentures and its classification.

(25 Hours)

Module III: The Sale of Goods Act: Sale of goods Act- Formation of sale of contract- sale and agreement to sell-Implied conditions and warranties-Sale by non owners-transfer of property title of goods- Rights of unpaid seller-Remedies for breach of Contract of Sale of goods- Goods and service Tax- Basic concepts- Challenges and opportunities-Applicability of CGST and SGST.

(25 Hours)

Module IV: Consumer Protection Act: Objectives of the Act-Rights of a Consumer- Consumer Protection Council- Central council and State council-Dispute Redressal Agencies –

District forum, State Commission and National Commission-Filing of complaints- Procedure of Filing Complaint.

(20 Hours)

References

1. Kapoor. N.D, Business Law, Sulthan Chand Publication
2. Tulsian. P.C, Business Laws, Tata McGraw-Hill Publishing Co. Ltd
3. Kuchal. M.C, Business Law
4. Sharma. S.C, Business Laws, International Publishers, Bengaluru

Marks Including Choice

Module	Marks
I	16
II	16
III	15
IV	13
Total	60

IV SEMESTER

CORE COURSE VI : HUMAN RESOURCE MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B06BBA	6	4	3

COURSE OUTCOME

CO1:understand basic concept and principles of Human Resource Management.
CO2: sensitize to the training process and methods.
CO3: equip with the importance of the performance management system in enhancing employee performance.
CO4: equip with the importance of the performance management system in enhancing employee performance.

Module I: Human resource management-introduction-meaning- evolution of Human Resource management-objectives of HRM-importance of HRM-functions and process of HRM-HR Manager-Duties and responsibilities. **(15 Hours)**

Module II : Acquiring Human Resources – HR planning –meaning-importance of HR planning-benefits of HR planning-HR planning process-job analysis-meaning-process of job analysis-methods-Job description-contents of job description-job specification- contents of job specification-methods of job analysis-job evaluation –meaning-methods-benefits- job enlargement-job enrichment- **Recruitment**-meaning and definition-sources of recruitment-**selection**-meaning-steps in selection process-difference between recruitment and selection-placement-induction and orientation. **(25 Hours)**

Module III: Developing Human Resources- Training and Development- training- meaning-need for training- training process-benefits of training-methods of training-types of training-importance of training in HRD-Executive development. **(16 Hours)**

Module IV: Rewarding Human Resources- performance Appraisal-meaning-definition-objectives-methods of performance appraisal-uses and limitations-compensation management-objectives-wage system-time rate –piece rate-incentives-factors influencing wage system-promotion- types-bases of promotion-benefits-transfer-types-demotion-reasons.

(18 Hours)

Module V: Human Resource Problems- Employee Discipline-meaning –importance-Absenteeism-causes-measures to control absenteeism- labour turnover-lay off- grievance reddressal-grievance –meaning-causes of grievance-importance of grievance reddressal-procedure of grievance handling. **(16 Hours)**

Skill Development Programmes

- Prepare chart showing the function of HRM and a brief explanation on the need for each function
- Prepare an advertisement for recruitment and selection of candidate for any organisation of your choice
- Develop a format for performance appraisal of an employee.
- Choose any MNC and present your observation on training programme.

(18 Hrs)

References:

Human Resource Management-text and cases-VSP Rao
Human Resource Management-Aswathappa
Human Resource Management-L.M.Prasad
Human Resource Management-T.N.Chabbra
Personnel Management-Edwin.B.Flippo.McGraw Hill
Personnel Management-C.B.Mamoria

Marks including choice:

Module	Marks
I	10
II	17
III	11
IV	12
V	10
Total	60

IV SEMESTER

CORE COURSE VII : FINANCIAL MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4BO7BBA	5	4	3

COURSE OUTCOMES

CO 1. Understand the concept and objective of financial management

CO 2. Develop the ability to select the feasible and viable investment proposal

CO 3. Apply decision making tools in organisational context

CO 4. Ability to assess the risk and return of investment projects

Module I: Financial Management: Meaning, scope and objectives, Goals of financial management – Profit maximization – wealth maximization **(10 Hours)**

Module II: Cost of capital Meaning and significance – Computation of cost of Debt – cost of preference capital – Cost of equity – Weighted average cost of capital. Capital structure – Meaning and definition – Factors affecting capital structure – Optimal capital structure – over capitalization – under capitalization – EBIT – EPS analysis. **(25 Hours)**

Module III: Working capital Management Meaning and definition – concepts of working capital – Factors affecting working capital – types of working capital- Financing of working capital – operating cycle concept of estimating working capital (Practical problems and theory) **(25Hours)**

Module IV: Capital budgeting: Meaning, definition – importance – techniques of capital budgeting – payback period – average rate of return – Net present value method – profitability methods – IRR – Merits and demerits of Non discounting and discounting techniques. **(30 Hours)**

References:

1. Financial management : M Y Khan and P.K Jain
2. Financial management: I MPandey
3. Financial management :R K Sharma &Shashi K Gupta
4. Financial management : Prasanna Chandra
5. Financial management :Geoffrey Knott

Marks including choice:

Module	Marks
I	5
II	15
III	20
IV	20
Total	60

IV SEMESTER

CORE COURSE VIII : OPERATIONS MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B08BBA	5	4	3

COURSE OUTCOME

CO 1: Understand the transformation system.
CO2: Identify the components involved in designing effective operations system.
CO3: Understand the meaning and importance of managing quality.
CO4: Understand the meaning and importance of productivity and ways to improve productivity.
CO5: Understand the decisions and process of operations management in business firms.

Module I: Introduction to Production Management : meaning- functions - Scope . Plant location - factors affecting location selection. Plant layout - principles-types of layout. **(20 Hours)**

Module II: Production system : Different production systems. Production Planning and control - importance - elements - PPC in different production systems. **(20Hrs)**

Module III: Materials management - Importance - Principles. Material handling: equipments used. Maintenance Management - Types of maintenance - Methods study-Time study - Motion study - principles – work measurement. **(20 Hrs)**

Module IV: Inventory management - Importance - Tools - ABC, VED, FSN Analysis - EOQ – Reorder point - Safety Stock - Lead time. **(15 Hrs)**

Module V: Quality Management: Quality improvement techniques - quality control techniques. Advanced manufacturing technologies - TOC, Lean / Green manufacturing, WCM.
(15 Hrs)

Books for Reference:

1) Production management : Aswathappa K
2) Russell, Roberta S, and Bernard W. Taylor III, Operations Management, Pearson Education, New Delhi.
3) Operations Management for Competitive Advantage, Tata McGraw Hill, New Delhi.
4) Buffa, E.S., ‘Modern Production Management’, New York, John Wiley

Marks including choice:

Module	Marks
I	14
II	13
III	13
IV	10
V	10
Total	60

IV SEMESTER

SKILL ENHANCEMENT COURSE II: IT TOOLS FOR BUSINESS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDITS	EXAM HOURS
IV	4A13BBA	5(3+2)	4	2

COURSE OUTCOMES

CO 1: Understand the working on word, PowerPoint, Excel etc.

CO2: Develop basic computer awareness for letter drafting, Slide making, Payroll preparation

CO3: Understand the various shortcuts for faster functioning on the computer system

Module I: Computer: History, classifications. Hardware – Input, Output, Storage Devices, Software – System software, Application software. Memory- Types of memory

(10Hrs)

Module II: Network of Computers- LAN, WAN, MAN, PAN. Network topologies, Internet, M-Commerce, WiFi **(10Hrs)**

Module III: Application of IT: Application in education, Health care, Business,

(6Hrs)

Module IV: Cyber ethics: Meaning, **Cyber crimes**:- Computer virus, WORMS, Malware, Trojan Horse, Cyber forgery, Hacking, Fishing, Salami attack ,Email bombing (Concept only)

(14Hrs)

Module V:MS WORD: MS word window components, New file, open file, Save. Save as, Editing text, adding word art, Alignment, setting paragraph, header and footer, Insert page number, Arranging text in Colomns, Creating a table, modifying a table, Formatting a table.

(20 Hours)

MS Excel: Creating worksheet with excel, spreadsheet, uses of spreadsheet, Editing cell contents, creating a simple formula, Creating a chart, Editing chart, Payroll preparation

(20 Hours)

MS Power point: Creating a New presentation, Choosing a Templates, Creating slides, and slide

(10 Hours)

References:

Computer Application in business: Dr R parameswaran

IT in action: Pearson

E Commerce: Gary P Schneider

Management Information System-managing the digital firm, Pearson Education: Kenneth C laudon and Jane P laudon

Marks including choice:

Module	Marks
I	5
II	5
III	5
IV	7
V	8
Total	30

IV SEMESTER

ABILITY ENHANCEMENT II: ENVIRONMENTAL STUDIES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4A14BBA	4	4	3

Course Outcomes

CO1. Acquire knowledge about environment and enable to contribute towards maintaining and improving the quality of the environment.

CO2. Understand the importance of protecting the environment and effect of environmental hazards

CO3. Analysis the ecosystem and the bio diversity nature of our country

CO4. Apply the awareness to point our Hot -spot of bio diversity in India and its conservation

CO5. Identify the effect of environmental Degradation and the role of Government in protecting the environment

CO6. Formulate some action plan to engage in activities for preventing environmental degradation.

Module I: Environmental studies- Meaning- definition-scope-Importance-Need-Components of environment: Lithosphere, Hydrosphere, Atmosphere and biosphere-need for public awareness-Natural resources: Forest resources. Water resources, Mineral resources, Energy Resources-Land resources-Role of individual in the conservation of natural resources-Equitable use of natural resources for sustainable life styles.

(18 Hours)

Module II: Eco-system- concept-Structure-Producers- Consumers- Decomposers-Energy flow in the eco-system-Bio-Diversity and its conservation: Introduction-Definition of genetic species and eco-system diversity- Value of Bio- diversity-Consumptive use- productive use- social , ethical and aesthetic value- Hot –spot of Bio-diversity- Threats to bio diversity- endangered and endemic species of India-Conservation of bio diversity: In -situ and Ex-situ conservation.

(18 Hours)

Module III: Environmental Degradation-Meaning-Types of pollutions- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution- control of Urban and

Industrial waste-Environmental Ethics-Issues and possible solutions-Climate change- Global warming-acid rain- Ozone layer Depletion- solid waste management

(18 Hours)

Module IV: Environmental Protection -National environment Policy- Environmental legislations-International conventions and agreements –GATT / WTO and environment-Role of central government -Pollution control Board and its role in environment protection-Environmental Impact Assessment (EIA)- Eco-friendly products- Environment Audit- Role of NGO in environment protection.- Environmental movements-Chipko Movement-Apico Movement-Silent Valley-Environmental communication and Public awareness.

(18 Hours)

References

1. Environment Management- G.N.Pandey, Vikas Publishing House
2. Text Book of Environment- K.M.Agrawal, MacMillan
3. Ecology and Economics-Ram Prasad Sengupta- Oxford
4. The Biodiversity of India-BharuchaErach, Mapin Publishing Ltd, Ahmadabad
5. UGC

Marks Including Choice

Module	Marks
I	15
II	15
III	15
IV	15
Total	60

SEMESTER IV

CORE COURSE IX : INDUSTRIAL VISIT AND REPORT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B09BBA	NIL	1	-

Every student shall prepare and submit a report based on industrial visit during the IV th semester under the guidance of a faculty member 1 month before the end of the semester. Evaluation shall be done internally. The maximum marks for the course shall be 25.

COURSE OUTCOMES

CO 1: acquire hands on experience of how industry operations are executed

CO2: analyses real life environment of business

CO3: enhance interpersonal skills and communication techniques.

CO4: acquire practical knowledge of industry practices and regulations

Internal Evaluation 25 marks	
Components	**Marks**
Punctuality	2
Organisation of report	18
Viva voce	5
Total	**25**

V SEMESTER

CORE COURSE X: BUSINESS RESEARCH METHODS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B10BBA	5	4	3

COURSE OUTCOMES

CO 1. Acquire basic concepts of research and its types

CO 2. Gain insight and acquire the ability to apply different research designs

CO 3. Acquire skill of data processing in terms of tabulation and classification.

CO4. Generate the ability to write research reports based on approved formats.

Module I: Introduction to research- Definition – Features –Scope of Research – Types of Research: Basic, Applied, Exploratory, Descriptive ,Experimental Research , Quantitative and Qualitative-Research Process - Steps in Research **(15Hrs)**

Module II: Research problem - Sources of research problem- Data collection- Primary and Secondary Data, Tools and techniques for collection of Data: Observational and Survey Methods – Questionnaire – Schedule, Difference between Questionnaire and schedule. **(25 Hrs)**

Module III: Research design–Meaning, Importance-Sampling Design: Selection of Appropriate Statistical Techniques : Probability: Cluster, Stratified, Systematic, Quota, Non probability: Judgemental, Convenience, snowball -Attitude measurement techniques .

(30 Hrs)

Module IV

Report writing- Types of Reports, Contents, stages of Report writing- Footnote-Bibliography

(20Hrs)

References

1. O.R.Krishnaswamy; Research methodology in Social Sciences, HPH, 2008.

2. R. Divivedi: Research Methods in Behavior Science, Macmillan India Ltd., 2001.

3. J.K. Sachdeva: Business Research Methodology HPH

4. S.N. Murthy, V. Bhojanna: Business Research Methods Excel Books

5. Levin &Rubin: Statistics for Management, Prentice Hall of India, 2002

6. Gupta S; Research Methodology and Statistical Techniques, Deep & Deep Publication (P) Ltd., 2002

7. Thakur D: Research Methodology in Social Sciences, Deep & Deep Publications (P) Ltd.,1998.

8. Tripathi P.C:A Textbook of Research Methodology, Sultan Chand & Sons, 2002.

9. Cooper: Business Research Methods 6th edition, MC Graw Hill,

10. C.R. Kothari, Research Methodology, Vikas Publications

11. Usha Devi N, Santhosh Kumar - Business Research Methodology

Marks Including Choice

Unit	Marks
I	15
II	20
III	15
IV	10
Total	60

V SEMESTER

CORE COURSE XI : ACCOUNTING FOR MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B11BBA	6	4	3

COURSE OUTCOMES

CO 1. Understand the concepts of cost and management accounting

CO 2. Prepare cost sheet and budgets of an organisation

CO 3. Analyse financial statements of corporate organisations using accounting ratios

CO4. Apply the concepts of marginal costing and standard costing in decision making

Module I: Management Accounting –Meaning, Definition, Nature, Scope, Difference between financial accounting, cost accounting and management accounting-Limitations of financial accounting- Recent trends in management reporting

(15 hours)

Module II: Cost Accounting- Concepts, objectives, scope, Uses- Elements of cost- cost classification-cost centre, cost unit- preparation of cost sheet. **(15 hours)**

Module III: Analysis and Interpretation of financial statements- Meaning, types, Methods (Brief discussion only)- Ratio Analysis: Meaning and nature, Uses, Limitations- Types of ratios: Liquidity-solvency- Turnover- Profitability-Market test ratios- Judgement of financial stability through ratios (stress should be given to problem solving and interpretation skills) **(30 hours)**

Module IV: Marginal costing: concept-definition-features- CVP Analysis: Meaning, importance, Limitations, Uses of P/V ratio- Margin of safety—Breakeven chart- Application of CVP analysis(Theory only) **(24 hours)**

Module V: Cost control Techniques: Budgetary control: concepts, objectives,- steps in budgetary control- Preparation of Budgets- (Cash budget and flexible budget only)- Standard costing: concept, uses, steps- Difference between budgetary control and standard costing- Variance analysis: (Material and labour **(24 hours)**

References

Management Accounting: Sharma RK and Sasi K guptha

Management Accounting: RSN Pillai and Bagvathi

Cost Accounting : SP Jain and KL Narang

Cost Accounting :Dr D Agarwal

Marks Including Choice

Unit	Marks
I	10
II	10
III	15
IV	15
V	10
Total	60

VI SEMESTER

CORE COURSE XIV: ORGANISATION BEHAVIOUR

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B14 BBA	6	4	3

CO1. Understand concepts, theories and techniques in the field of human behavior at individual, group and organization level.

CO 2. Understand personality determinants within personal and organizational context.

CO3. Understand concepts of learning and motivation and its context in organizational setting.

CO4. Identify the role and relevance of group dynamics in organizational management.

Module I: OrganisationalBehaviour - Definition, meaning and nature, scope and application in management, Contribution of other disciplines to OB, Emerging issues in OB - Attitude, Meaning ,Characteristics, and Components of Attitude , Attitude formation, change in attitude and barriers to attitude.,- Leadership , leadership styles. **(18 hours)**

Module II: Personality- Determinants of personality, Factors- Personality theories- Trait theories , Type theories, psycho analytic theories and humanistic theories. **(25 hours)**

Module III: Perception- factors affecting perception,-Learning, theories of learning- classical, operant, and social theories- Motivation, role and importance , Theories of motivation- Herzberg, Mcgregor, Maslow, Bandura **(25 hours)**

Module IV : Group behavior- Group dynamics, features and types of group, stages of group development, group norms, group cohesion- Group conflict, types of conflict, conflict resolution

(20 hours)

Module V : Organisational change and development- Nature of work change, Types of change, Factors influencing change, overcoming resistance to change - Organisational development-meaning, benefits and steps in OD **(20hours)**

References:

1. K. Aswathappa, Organizational Behaviour, HPH.

2. Appanniah&, Management and Behavioural Process, HPH.

3. Rekha&Vibha – Organizational Behavioural, VBH. 20

4. Robbins, Organizational Behaviour, International Book House.

5. John W. Newstrom&Kieth Davis, Organizational Behaviour, McGraw Hill.

6. P.G. Aquinas Organizational Behavior, Excel Books.

7. Fred Luthans, Organizational Behaviour. McGraw Hill.

8. M. Gangadhar. V.S.P.Rao and P.S.Narayan, Organizational Behaviour

9. M.N.Mishra: OrganisationalBehaviour and Corporate Development, HPH.

10. Karamapl : Business Management & Organizational Behavioral I.K. International

11. N.S. Gupta, Organizational Behaviour, HPH.

12. Jit. S. Chandan, OrganisationalBehaviour, Vikas Publishing House.

13. Sharma R.K & Gupta S.K, Management and Behaviour Process, Kalyani Publishers.

14. K. Venkataramana, OrganisationalBehaviour, SHBP.

Marks Including Choice

Unit	Marks
I	10
II	10
III	15
IV	15
V	10
Total	60

VI SEMESTER

CORE COURSE XV: BANKING THEORY AND PRACTICE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B15 BBA	5	4	3

COURSE OUTCOMES

CO1. Acquire knowledge about basics of banking
CO2. Understands the law and practices of banking
CO3. Understands the various banking terminologies
CO4. Acquire knowledge of modern banking practices

Module I: Introduction to banking: origin and development of banking- structure of banking in India- Commercial banks- Functions-central bank-RBI: functions, fiscal and monetary policy- Banking Regulation Act 1949, Loans and advances: fixed advance, cash credit, overdraft, letter of credit, bill discounted- principles of sound lending.

(20 Hours)

Module II: Banker and customer relationship: Banker and customer-meaning- General and special relationship- Types of customers and account holders- minors, joint account holders, partnership firms, joint stock company with limited liability, executors, trustees, clubs and associations, joint hindu family- Procedure for opening and closing of accounts.

(25 Hours)

Module III: Negotiable instruments: Introduction-meaning and definition, features, kinds of negotiable instruments(meaning only)- cheques: meaning, definition, features- parties – crossing of cheques- types of crossing- Endorsement: meaning, essentials, kinds of endorsement, Dishonour of cheque, reason for dishonour.

(25 Hours)

Module IV: Technology in banking : need and importance- virtual banking- ATM- credit card- Debit card- Telebanking,m-banking, internet banking- RTGS(Real time Gross settlement), NEFT, Electronic Fund Transfer(EFT), SWIFT (society for worldwide interbank financial telecommunication)- concept of core banking- Universal banking and Green banking(concept only) **(20 Hours)**

Skill Development Activities

- collect and fill account opening form of SB and current A/c
- collect and fill pay-in-slip of SB and current A/c
- Draw different types of endorsement of cheques
- List customer services offered by at least two banks of your choice

References

1. Banking Theory law and practice: Gorden and Natarajan, Himalaya Pub.
2. Banking law and practice : Maheswari.S.N., Kalyanipubishers
3. Banking Theory law and practice: Shekhar.K.C, Vikas publishing House
4. Modern banking: K.P.M. Sundharam and E.N.Sundharam, Sulthanchandans sons

Marks Including Choice

Unit	Marks
I	15
II	15
III	15
IV	15
Total	60

I SEMESTER

CORE COURSE XVI :PROJECT REPORT AND VIVA VOCE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B16 BBA	2	2	-

COURSE OUTCOMES

CO1: Analyses real life situations

CO2: Acquires group dynamic skills by group involvement

CO3: Develops solutions or inferences on the problem of study

CO4: Sythesis facts in the form of report

During the sixth semester the candidate shall do a research project on a relevant business/ management/banking/commerce topic. This research project is envisaged as a practical application of the research methodology course studied in the BBA Programme. Therefore, it is essential that primary data is collected as part of the research at least to some extent. Maximum four students as a group can take up a topic and the students in consultation and with the consent of the assigned guide may identify a topic and do research on that topic. To have more academic freedom and flexibility, the project shall be done without being attached to any business organization. The candidates together shall prepare and submit a project report to the Department. The project report should be submitted to the Head of the Department on the last working day of the sixth semester. The candidates together as a group shall prepare a copy of the report and submit them in the department, which shall be handed over to the external examiner at the time of viva-voce examination. Each student in the group should also keep a personal copy with them . The report shall be prepared as per American Psychological Association (APA) or Modern Language Association (MLA) format. Use of Statistical software Students shall be encouraged to use statistical software for data analysis.

Sample size

Since the project is a group exercise, at least 100 samples should be selected for the study

Structure of the Project report

1. Title page
2. Declaration by the student
3. Bonafide Certificate from guide countersigned by HOD
4. Acknowledgement
5. Table of Contents
6. List of Tables
7. List of figures
8. List of Symbols, Abbreviations
9. Chapter I: Introduction (Background information, Statement of the Research problem, objectives of the study, Research methodology etc.)
10. Chapter II: Review of literature
11. Chapter III: Theoretical framework
12. Chapter IV: Data Analysis and Interpretation
13. Chapter V: Summary of findings and implications and Recommendations
14. Bibliography (books, journal articles etc. used for the project work).
15. Appendix (Questionnaire, specimen copies of forms, other exhibits etc.)

Page size and typing instructions

The project report shall be prepared in A4 sized bond paper. The report shall be printed and spiral bound/hard bound with not less than 60 pages. The general text of the report shall be typed with 1.5 line spacing. The general text shall be typed in the font ‘Times New Roman’ with font size 12. Paragraphs shall be arranged in justified alignment with margins 1.25” each on top, bottom, left and right of the page with portrait orientation. No boarder line should be given to the pages.

Evaluation of project report

The project report shall be subject to internal and external evaluation: Maximum 10 marks shall be awarded by the supervising teacher as the internal mark. Maximum 40 marks shall be awarded by external examiners. Out of the external 40 marks, 20 marks shall be given for the report and 20 marks shall be given for the performance in viva voce examination as specified below. All the group members shall be given equal marks for their report and the viva-voce marks may vary based on the performance of each student in viva voce examination. Internal Evaluation (10 marks or 20% of total marks) and External Evaluation (40 marks or 80% of total marks).

Internal Evaluation **10 marks**	
Components	**Marks**
Punctuality	2
Organisation of report	4
Viva voce	4
Total	**10**

External Evaluation **40 marks**		
Components	**Sub components**	**Marks**
1. Project report	Relevance of the topic, statement of objectives	5
	Methodology, Research design	5
	Use of statistical tools, Analysis and interpretation, major findings	5
	Recommendations, references/bibliography	5
	Total	**20**
2.Viva voce	Viva voce	**20**
	Total	**40**

PART B

DISCIPLINE SPECIFIC ELECTIVE COURSE I

FINANCE

CORE COURSE XII (DSEC):-ADVANCED FINANCIAL MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B12BBA	6	4	3

COURSE OUTCOMES

CO1: To familiarize the students with advanced financial analysis and Decisions.

CO2: To equip the students with knowledge about the financing, dividend and liquidity areas of financial decision making in business organisation.

CO3: Demonstrate the importance of working capital management and the tools to manage it.

CO4: Provide the learners with the skills to evaluate complex investment situations.

Module I: Financial Management- meaning-nature - scope-traditional vs. modern concept-goal of financial management-profit vs. wealth maximization-finance function-role of finance manager-financial planning-meaning- steps in financial planning.

(25 Hours)

Module II: Leverages and Capital Structure –part 1.Leverages-meaning-types-operating leverage-financial leverage-combined leverage (problems) part 2.capital structure-meaning-factors affecting capital structure-theories of capital structure- Net Income Approach-Net Operating Income Approach- Traditional theory-MM theory **(30 Hours)**

Module III: Planning and forecasting of working capital –concept of working capital-determinants of working capital-estimating working capital needs-methods-operating cycle method-net current asset forecast method-cash management-motives of holding cash-cash management techniques-preparation of cash budget-receivables management-preparation of Ageing schedule-and debtors turnover ratio—inventory management techniques-problems on EOQ . **(35 Hours)**

Module IV: **Dividend theories**-introduction-meaning of dividend-forms of dividend-irrelevance theory-MM model-Relevance theory-Walters model-Gordon's model-problems on dividend theories. **(18 Hours)**

References:

1. I.M.Pandey Financial management: Vikas publishing house, New Delhi
2. Prasanna Chandra Financial management: Tata McGraw Hills, New Delhi
3. M.Y.Khan & P.K.Jain Financial management: Tata McGraw Hills, New Delhi
4. Brealy and Steward Corporate finance: McGraw Hills, New York
5. Bhattacharya working capital management, strategies and techniques prentice Hall ,Delhi
6. R.K.sharma & S.K.Guptha Financial management
7. V.K.Bhalla Financial management
8. S.C.Kuchal Financial management

Marks including choice:

Module	Marks
I	14
II	17
III	19
IV	10
Total	60

CORE COURSE XIII (DSEC): INCOME TAX LAW AND PRACTICE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B13BBA	6	4	3

COURSE OUTCOMES:

CO1: understand the basic concepts and definitions under the Income Tax Act,1961.

CO2: Acquire knowledge about Computation of Income under different heads of Income of Income Tax Act,1961.

CO3: Acquire Knowledge about the submission of Income Tax Return, Advance Tax, Tax deducted at Source, Tax Collection Authorities.

CO4: Acquire Competency in taking up employment in Tax planning and management.

Module 1: Income Tax Act-1961. (Meaning ,Concepts and Definitions): Income, Person, Assessee, Assessment year, Previous year, Agricultural Income, Exempted Income, Residential Status of an Assessee, Capital and Revenue Income and expenditure. **(20 Hrs.)**

Module II : Computation of Taxable Income under the different heads of Income.:

a) Income from Salary: Salient features, meaning of salary, Allowances and tax Liability-Perquisites and their Valuation- Deductions from salary.(Theory and Problems)

b) Income from House Property: Basis of Chargeability-Annual Value-Self occupied and let out property- Deductions allowed (Theory and Problems)

c) Profits and Gains of business or profession: Definitions-business, profession, , computation of profits and gains- deductions and deductions disallowed (Theory and Problems)

d) Capital Gains: Chargeability-definitions- Short term and long term capital gains-deductions, exemptions (simple problems only)

e) Income from other sources: Chargeability-deductions-Amounts not deductible. (simple problems only) **(50 Hrs.)**

Module III: Computation of Total Taxable Income of an Individual:

Aggregation of income, clubbing, setoff and carry forward, deductions from GTI, computation of total income and tax liability of individual **(38 Hrs.)**

Books for References:

1. Income Tax law and Accounts: Dr HC Mehrotra and Dr SP Goyal

2. Direct taxes Law and Practice: Vinod K Singhaniya

3. A P Philip: Direct Taxes Law & Practice

4. Income tax Law and Practice :Dr.Bhagavathi Prasad

5. Income tax Law and Practice : Gaur and Narang

Marks including choice:

Module	**Marks**
I	15
II	30
III	15
Total	**60**

CORE COURSE XVII (DSEC): INSURANCE AND RISK MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B17BBA	6	4	3

COURSE OUTCOMES:

CO1: Demonstrate a working knowledge of thelanguage and procedures associated with risk management.

CO2: Perform risk management review for individuals and organizations.

CO3: Apply insurance contracts to address risk management needs of individuals and organizations.

CO4: Analyze information to determine if a lossexposure may be covered by property insurance contract(s).

Module I: Concept of Risk: Meaning- types- sources- types- measurement of risk(Theory only)- risk evaluation and prediction, risk retention and transfer. **(25 Hours)**

Module II: Introduction to Insurance: Nature of Insurance Contract- principles of insurance- contribution and subrogation- indemnity- need for insurance- legal aspects of insurance contract- Reinsurance, Co-insurance, Assignment. **(30 Hours)**

Module III: Life Insurance: Features- classification of policies- surrender value- applications and acceptance- related documents- assignments- nomination- waiver of evidence of title.

(20 Hours)

Module IV: General Insurance: Types: Fire and motor, health, marine, automobile (burglary and personal accident insurance). **(18 Hours)**

Module V: Regulation of Insurance in India: Control of malpractices, negligence- computation of insurance premium- regulatory framework of insurance: roles, powers, functions of IRDA.

(15 Hours)

References:

1. George, E. Rejda, Principles of Risk Management and Insurance, Pearson Education.
2. Dorfman, Marks S., Introduction to Risk Management and Insurance, Pearson
3. Gupta. P.K, Insurance and Risk Management, Himalaya Publishing House.
4. Mishra, M. N., Principles and Practices of Insurance, S. Chand and Sons.
5. Black, K. and H.D. Skipper, Life and Health insurance, Pearson Education
6. Crane, F., Insurance Principles and Practices, John Wiley and Sons, New York.
7. Vaughan, E. J. and T. Vaughan, Fundamentals of Risk and Insurance, Wiley & Sons

Marks including choice:

Module	**Marks**
I	14
II	17
III	11
IV	10
V	8
Total	60

COURSE XVIII (DSEC): STOCK AND COMMODITY MARKETS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B18BBA	6	4	3

CO 1. Acquire knowledge on conceptual framework of Stock Markets and Commodity Market functioning in the economy.

CO 2. Understand different modes of trading.

CO 3. Demonstrate skill in terms of stock and derivative trading.

Module I:An overview of capital and commodity markets: Primary Market, Secondary Market (Stock Market), Depositories, Private placements of shares / Buy back of shares, Issue mechanism. Meaning of commodity and Commodity markets, Difference between Stock Market and Commodity Market. **(18Hours**)

Module II: Stock market: History, Membership, Organization, Governing body, Functions of stock Exchange, on line trading, role of SEBI, Recognized Stock Exchanges in India (brief discussion of NSE BSE and Nifty). Derivatives on stocks: meaning, types (in brief). **(23 Hours)**

Module III: Trading in stock market: Patterns of Trading & Settlement – Speculations – Types of Speculations – Activities of Brokers – Broker Charges – Settlement Procedure, National Securities Depository Ltd.(NSDL) Central Securities Depository Ltd.(CSDL) (in brief). **(22 Hours)**

Module IV: Commodity market: Evolution, Commodity derivatives, Commodity exchanges- Regional & National and International, Functions, role, objectives and types- Types of transactions in Commodity market – Spot, Future and Forward options markets. **(23 Hours)**

Module V: Trading in commodity markets: Patterns of Trading & Settlement, Price discover, Efficiency of Commodity Markets - Size of Commodity Markets in India - Benefits of Commodity Markets. **(22 Hours)**

References

1. Gurusamy, Financial Markets and Institutions, 3rd edition, Tata McGraw Hill.

2. SrivastavaRM : Management of Financial Institutions, HPH

3. Saunders, Financial Markets and Institutions, 3rd edition, Tata McGraw Hill.

4. Bharat Kulkarni; Commodity Markets and Derivatives, Excel Books.

5. Khan, Indian Financial Systems, 6th edition, Tata McGraw Hill 62

Marks including choice:

Module	**Marks**
I	10
II	12
III	15
IV	13
V	10
Total	**60**

DISCIPLINE SPECIFIC ELECTIVE COURSE II

HUMAN RESOURCE MANAGEMENT

CORE COURSE XII (DSEC); HUMAN RESOURCE DEVELOPMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDITS	EXAM HOURS
V	5B12BBA	6	4	3

COURSE OUTCOMES:

CO1: Understand the HRD Practices in corporates

CO2: Contribute to the development and improvement of Organisation's systems and strategies leading to an optimal HRD Climate.

CO3: evaluates the performance management Programme

CO4: contribute to the development, implementation and evaluation of employee recruitment, selection and retention plans

Module - I: Human Resource Development (HRD): Concept, Origin and Need, Relationship between human resource management and human resource development; HRD as a Total System; Activity Areas of HRD: Training, Education and Development; Roles and competencies of HRD professionals. **(25 Hours)**

Module - II: HRD Process: Assessing need for HRD; Designing and developing effective HRD programs; Implementing HRD programs; Evaluating HRD programs. HRD Interventions: Integrated Human Resource Development Systems, Staffing for HRD; Physical and Financial Resources for HRD. HRD and diversity management; HRD Climate; HRD Audit.**(35 Hours)**

Module – III: HRD Applications: Coaching and mentoring, Career management and development; Employee counselling; Competency mapping, High Performance Work Systems, Balanced Score Card, Appreciative inquiry. Integrating HRD with technology. **(25 Hours)**

Module – IV: Evaluating the HRD Effort; Data Gathering; Analysis and Feedback; Industrial relations and HRD. HRD Experience in Indian Organizations, International HRD experience, Future of HRD. **(23 Hours)**

References:

1. Nadler, Leonard: Corporate human Resource Development, Van Nostrand Reinhold / ASTD, New York.

2. Rao T.V. and Pareek, Udai: Designing and Managing Human Resource Systems, Oxford and IBH Publication Ltd.

3. Rao T.V.: Reading in human Resource Development, Oxford IBH Publication .Ltd.

4. Viramani B.R. and Seth, Pramila: Evaluating Management Training and Development, Vision Books.

5. Rao T.V.: Human Resource Development, Sage publication.

<u>Marks including choice</u>:

Module	**Marks**
I	14
II	19
III	14
IV	13
Total	**60**

CORE COURSE XIII (DSEC) : PERFORMANCE AND COMPENSATION MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B13BBA	6	4	3

COURSE OUTCOMES:

CO1: Understand concepts of performance and compensation management and how to use them to face the challenges of attracting, retaining and motivating employees to high performance.

CO2. Describe the process and evaluate the implications of job evaluation

CO3. Illustrate different ways to strengthen the pay for performance link

CO4. Understand the legally required employee benefits

Module I Introduction: Concept, Philosophy, History from performance appraisal to performance development. Objectives of performance management system; Performance management and performance appraisal; Performance Management process: Performance planning, Process and Documentation of Performance appraisal, Appraisal Interview, Performance Feedback and Counselling. **(25 Hours)**

Module II Performance management and reward systems: Performance Coaching ,Mentoring and Counselling, Competency development, Use of technology and e-PMS, International Aspects of PMS. Performance systems trends, Ethical Perspectives in performance appraisal. **(20 Hours)**

Module III: Job Evaluation: Introduction- Methods of Job Evaluation- Company Wage Policy: Wage Determination, Pay Grades, Wage Surveys, Wage Components. Modern trends in compensation - from wage and salary to cost to company concept, Comparable worth, broad-banding, competency based pay. **(20 Hours)**

Module IV: Incentives plans for production employees and for other professionals:

Developing effective incentive plans, pay for performance, Supplementary pay benefits, insurance benefits, retirement benefits, employee services benefits. Benefits & Incentive practices in Indian industry. **(20 Hours)**

Module V: Wages in India: Minimum wage, fair wage and living wage.- Methods of state regulation of wages. Wage differentials & national wage policy Regulating payment of wages, wage boards, Pay commissions, dearness allowances, linking wages with productivity,. Special compensation situations: International compensation-managing variations. Expatriate Pay.

(23 Hours)

References:

1. Milkovich & Newman , Compensation, McGraw Hill.

2. T.J. Bergman , Compensation Decision Making, Harcourt, Fort Worth, TX

3. Richard Henderson: Compensation management in a knowledge based world, Prentice Hall.

4. T.N.Chhabra & Savitha Rastogi Compensation management, Sun India Publications.

5. Gary Dessler , Human Resource Management, Prentice Hall.

6. Armstrong's Handbook of Performance Management: An Evidence-Based Guide to Delivering High Performance :Book by Michael Armstrong.

7. Bhattacharyya, D.K.: Performance management systems and strategies, Pearson Education.

Marks including choice:

Module	**Marks**
I	14
II	11
III	11
IV	11
V	13
Total	**60**

CORE COURSE XVII (DSEC): COUNSELLING AND NEGOTIATION SKILLS FOR MANAGERS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDITS	EXAM HOURS
VI	6B17BBA	6	4	3

COURSE OUTCOMES:

CO1: -Understand the behavioural issues at work place

CO2: Understand basic concepts of counseling and negotiations.

CO3. Understand the role of negotiations in organisations

CO4: Acquire negotiation skill to deal organizational issues

Module I Counselling: Introduction, Approaches to Counselling, Goals and Process of Counselling; Counselling Procedures and Skills, Organizational Application of Counselling Skills. **(25 Hours)**

Module II Changing Behaviours through Counselling: Specific Techniques of Counselling; Role conflicts of Managers and Counselling-Application of Counselling in Specific Organizational Situations: Dealing with problem Subordinates; Performance Management; Alcoholism and Other Substance Abuse- Ethics in Counselling. **(35 Hours.)**

Module III Negotiation: Introduction, Nature and need for negotiation, negotiation process, Types and styles of negotiation; strategies and tactics; barriers in effective negotiation, Communication Style, Breaking Deadlocks. ` **(25 Hours.)**

Module IV Role of trust in negotiations: Negotiation and IT; ethics in negotiation; cultural differences in negotiation styles; gender in negotiations; context of mediation; negotiation as persuasion. **(23 Hours.)**

References:

1. Singh Kavita - Counselling Skills for Managers (PHI)

2. Carroll, M.: Workplace counseling, Sage Publication.

3. Kottler, J. A., & Shepard, D. S.: Introduction to counselling: voices from the field, USA: Cengage Learning.

4. Moursund, J.: The Process of counselling and therapy, New Jersey: Prentice Hall.

5. Patterson, L. E., &Welfel, E. R.: The counselling process: A multitheoretical integrative approach, New York: Brooks Cole.

6. Kolb, D., & Williams, J.: The Shadow Negotiation. UK: Simon & Schuster.

7. Korobkin, R.: Negotiation theory and strategy, Aspen Publisher. 8. Lewicki, R.: Essentials of negotiation. Alexandria V. A.: Society of HRM.

Marks including choice:

Module	**Marks**
I	14
II	19
III	14
IV	13
Total	**60**

CORE COURSE XVIII (DSEC): ORGANISATIONAL CHANGE AND DEVELOPMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	**6B18BBA**	**6**	**4**	**3**

COURSE OUTCOMES:

CO1: Understand the significance of innovation and creativity in business

CO2: Understand the need for Organisational change and development in the modern Organisations.

CO3: Adapt to changing corporate circumstances and become efficient managers in the modern era.

CO4: Scale up their path towards career development by means of developing their individual potentialities.

Module I: CHANGE MANAGEMENT: The importance and nature of change. Change and human response. Introducing change effectively: Basic steps, factors influencing change-resistance to change, overcoming resistance to change. **(25 Hours)**

Module II: ORGANIZATION EFFECTIVENESS: Organization effectiveness: Concept, problems in measurement of effectiveness. System - level criteria of judging effectiveness. **(23 Hours)**

Module III: ORGANIZATIONAL DEVELOPMENT: The nature of Organizational Development (OD): Assumptions and values. Relevant systems concepts. Action research, OD Interventions: Team interventions, Inter-group interventions, personal, interpersonal and group processes interventions: A descriptive inventory of OD interventions. **(35 Hours.)**

Module IV: CREATIVITY & INNOVATION: Creativity & Innovation: Meaning, Need, Components of Creativity & Innovation, Organizational Constraints, Organizational environment for Creativity & Innovation. **(25 Hours.)**

References:

1. Dunnette, M.D. (Ed.) (1976). Handbook of Industrial and Organizational Psychology. Chicago: Rand McNully.

2. French, W.L.; & Bell, C.H. Jr. (1980). Organizational Development. London, Prentice Hall. 3. Herbert, T.T. (1981). Dimensions of Organizational Behavior. London: MacMillan.

4. Schemerhorn, Osborn and Hunt (2012). OrganisationalBehaviour.Wiley Publications.

5. Khandwalla, P.N. (1988). Organizational effectiveness. In J. Pandey (Ed.) Psychology in India: The State-of-the Art (Vol.3, pp. 97-215). New Delhi: Sage.

6. Luthans, F. (1989). Organizational Behaviour. London: McGraw Hill.

7. Margulies, N.; &Raia, A.P. (1975). Organizational Development: Values, process and technology. New Delhi: Tata McGraw Hill.

8. McGill, M.E. (1977). Organizational Development for Operating Managers.AMACO (a division of American Management Association).

Marks including choice:

Module	**Marks**
I	14
II	13
III	19
IV	14
Total	**60**

DISCIPLINE SPECIFIC ELECTIVE COURSE III

MARKETING

CORE COURSE XII (DSEC): CONSUMER BEHAVIOUR

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS
V	5B12BBA	6	4	3

COURSE OUTCOME

CO 1: Understand the relevance of consumer behavior theories and concepts to marketing decisions.

CO2: Use appropriate techniques to apply market solutions.

CO3: Acquire social and ethical implications of marketing actions on consumer behaviour

CO4: Formulate marketing strategies that influence consumer behaviour

Module I: Consumer Behaviour: Nature, scope & application- Importance of consumer behaviour in marketing decisions - characteristics of consumer behavior - consumer research- consumer buying process: concepts - importance - need and elements involved in buying process - Factors influencing buying process -Economic and legal factor - Social factors - Psychological factors - Behavioral factors. **(32 - Hours)**

ModuleII : Consumer decision process: Types of Decision process– Models of consumer behaviour (Economic model - Psychoanalytic model - Sociological model - Howard &Sheth model) – individual determinants of consumer behavior. Group Dynamics and consumer reference groups – definition of group – Group dynamics including roles, norms, cohesiveness leadership & conformity – reference groups, Family decision making. Culture and Social class: Social stratification – characteristics of social class – Social influence on consumer – Culture, sub-culture – Problems of cross culture marketing. Diffusion of innovation – Consumer decision making for new products – brand – loyalty **(40 - Hours)**

Module III: Post purchase behaviour and market regulation - Defining post purchase behavior -consumer's post purchase dissonance - satisfaction - dissatisfaction. - Consumer Protection Act 1986 -rights of consumers- Profile of Indian consumers; Behavioural patterns of Indian consumers; Problems faced by Indian consumers **(26 - Hours)**

Module IV: Organisational buying behavior: Buying decisions involved in industrial buying process – Factors influencing industrial buying process **(10 - Hours)**

Books for Reference:

1. Consumer Behaviour : Blackwell, Miniard& Engel
2. Consumer choice Behaviour : Howard John, Hagadish and Sheth
3. Consumer Behaviour : Mehta &Subhas
4. Consumer Behaviour in India : Syam and Babu
5. Consumer Behaviour- Concepts, Applications & Choices : M.S.Raju, Dominique Xardel

Marks including choice:

Module	Marks
I	18
II	22
III	14
IV	6
Total	60

CORE COURSE XIII (DSEC) : ADVERTISING AND BRAND MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B13BBA	6	4	3

COURSE OUTCOME

CO 1: Understand the fundamental theories, concepts, and frameworks in advertising and brand management

CO2: Apply advertising and branding techniques in different situations

CO3: Understanding ethical challenges related to responsible management advertising and brand strategy

CO4 : Acquires skill in media planning and scheduling

Module I : Advertising - Meaning - definition - Features - significance - Functions - Classification - Future of advertising - Definition & growth of modern advertising, advertising & the marketing mix, Social & economic aspects of advertising- AIDA model of advertising- types of ad appeals- Creativity in advertising - Concept of copy - different types of copy, copy writing, copy research , creating copy strategies, brand image, execution, USP - Advertising Effectiveness – Concept, importance, difficulties, Measurement - direct measures(historical sales method - experimental control) , indirect measures - Recall of advertising message - attitude change **(30- Hours)**

Module II : Media planning & scheduling: Introduction to broadcast & non -broadcast media; Budgeting decision rule: percentage of sales method, objective to task method, competitive parity, & all you can afford; Key factors influencing media planning; Media decisions: media class, media vehicle & media option; Scheduling: flighting, pulsing, & continuous Advertising Business - Adv Agency - Types of agency - functions and selecting an Ad agency - Adv agency and client relationship - Social implications of advertising - Moral and Ethical issues in advertising **(38 - Hours)**

Module III: Introduction to brands and brand management, Concept of a brand, brand evolution, branding challenges and opportunities, Strategic brand management process. Identifying and establishing brand positioning and values; Brand building, brand positioning and values brand repositioning. **(20 - Hours)**

Module IV: Designing and implementing brand strategies; Brand extension. Brand hierarchy Kapfrer. Brand equity, measurement of brand equity, brand personality, brand image, managing brands overtime. Integrating advertising and brand management

(20- Hours)

Books for Reference:

1. Aaker, Myers &Batra : Advertising Management , Prentice Hall.
2. Wells,Moriarity&Burnett : Advertising Principles & practices , Prentice Hall.
3. Sen Gupta, Subrato: Brand Positioning, Tata McGraw Hill, Delhi
4. Kapferer, J.N.: Strategic Brand Management, Kogan Page, London .
5. Kuller, K.L.: Strategic Brand Management, Prentice Hall, New Delhi.
6. Moorthy, Y.L.R.: Brand Management, Vikas Publication House, New Delhi.
7. Aaker, David A: Building Strong Brands, Free Press, New York Jones, John Philip:

Marks including choice:

Module	Marks
I	16
II	20
III	12
IV	12
Total	60

CORE COURSE XVII (DSEC) : LOGISTICS MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B17BBA	6	4	3

COURSE OUTCOMES:

CO1: Understand the structure of supply chains and the different ways through which supply chains can become competitive in the market .

CO2: Explain how to use the levers of the logistics strategy to redefine the points necessary to make this harmonization.

CO3: Analyse the importance of the term “value creation” and to propose actions in the field of management of logistics costs towards the creation of value.

CO4: Distinguish the forces shaping international logistics in a global market.

CO5: Assess accurately the risks occurred due to loss of focus on the satisfaction of end□customer demand

Module I:Introduction to logistics: Fundamentals of Logistics – Definition and Activities – Aims and Importance – Progress In Logistics and Current Trends- Organisation and Achieving Integration- elements and objectives of logistics management – logistics management v/s supply chain management – integrated logistics: objectives.

(35hrs)

Module II: Supply Chain Management: Meaning and definition- components/ participants of SC- concept of SCM- Objectives of SCM- SCM process - Factors driving the evolution of SCM – objectives of SCM – Bull-whip effect - supply chain planning.

(30hrs)

Module III: Customer Service: Customer relationship management, Customer service management, Demand management, Customer order fulfillment, Manufacturing flow management, Procurement management/Supplier relationship management, Returns management

(30 hrs)

Module IV: Warehouse Management: Introduction; Definitions ; Evolution of Concept of Warehousing; Importance - Benefits of Warehousing; Warehouse Operating Principles; Developing the Warehouse Resource.

(13 hrs)

Books for References:

1. Agrawal D. K., Logistics and Supply Chain Management, Macmillan, 2009

2. Raghuram G, and Rangaraj N, Logistics and Supply Chain Management, Macmillan Publication., 2000.

3. Alan Harisson & Remko van Hoek, “Logistics Management and Strategy: Competing Through the Supply Chain”, FT Press, 2011

4. Martin Christofer. “Logistics & Supply Chain management” , Pearson Education Limited, 2005

Marks including choice:

Module	**Marks**
I	19
II	17
III	17
IV	7
Total	60

CORE COURSE XVIII (DSEC) : RETAIL MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B18BBA	6	4	3

COURSE OUTCOMES

CO 1: Understand basic marketing theories, principles, practices and terminology related to each functional area of business.

CO2: Identify the ways that retailers use marketing tools and techniques to interact with their customers and perform basic functions appropriate to each functional area of business.

CO3: Analyse the contribution of retailers to the product value chain; consumer motivations, shopping behaviours, and decision processes for evaluating retail Offering and purchasing merchandise and services; corporate objectives, competitor analysis, and competitive strategy.

CO4: Understand how retailers differentiate their offering as an element in their corporate strategy and factors affecting strategic decisions involving investments in locations, supply chain and Information systems, and customer retention program.

Module I :Introduction to Retailing-Introduction to Retailing, Definition, Characteristics, Evolution of Retailing in India, Retailing in India, Emerging Trends in Retailing, Factors Behind the change of Indian Retail Industry.

(22Hours)

Module II: Retail Formats and operations-Retail Sales by ownership, On the basis of Merchandise offered, non - store Based retail mix & Non- traditional selling. Retail Operation: Elements/Components of Retail Store Operation, Store Administration, Store Manager – Responsibilities, Inventory Management, Management of Receipts, Customer Service, Management of Retail Outlet/Store, Store Maintenance, Store Security.

(35Hours)

Module III: Store Planning-Design & Layout, Location Planning and its importance, retailing image mix, Effective Retail Space Management, Floor Space Management. **(12Hours)**

Module IV: Retail Marketing-Advertising & Sales Promotion, Store Positioning, Retail Marketing-Mix, CRM, Advertising in Retailing.

(14Hours)

Module V: Retail Merchandising and Merchandise Pricing- Buying function, Mark-ups & Mark-down in merchandise management, shrinkage in Retail merchandise management. Concept of Merchandise Pricing, Pricing Options, Pricing Strategies, Pricing Objectives, Types of Pricing. **(25 Hours)**

Books for References:

1. Cullen & Newman: Retailing – Environment & Operations, Cengage Learning EMEA,2013
2. Berman &Evarv: Retail Management, Perntice Hall.,2017
3. Bajaj, Tuli&Srivastava: Retail Management- Oxford University Publications,2016
4. Gibson G Vedamani: Retail Management: Functional principles & practices, Jaico Publishing House.2014
5. Harjit Singh: Retail Management, S. Chand Publication,2011
6. Newman A.J. and Cullen P - Retailing : Environment and Operations (Vikas, 1st Ed.),2012
7. Berman B and Evans J.R - Retail Management (Pearson Education, 9th Ed.),2011
8. Michael Levi M and Weitz BW - Retailing Management (Tata McGraw Hill, 5th Ed.),2013
9. Dunne Patrick M., Lusch Robert F. and Griffith David A - Retailing (Cengage Learning, 4th Ed.), 2013.

Marks including choice:

Module	Marks
I	12
II	19
III	7
IV	8
V	14

PART - C

GENERIC ELECTIVE COURSES

GENERIC ELECTIVE COURSE I: CUSTOMER RELATIONSHIP MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5DO1BBA	2	2	2

Course Outcomes:

Co1: Understand the concept of CRM in digital era with modern changes in the recent world.

Co2: Identify the dimensions to evaluate customers’ satisfaction .

Co3: Apply various strategies to improve the customer loyalty and maintaining the long-term-customer relationships.

Co4: Analyse the recent initiatives taken by MNCs to improve customers’ satisfaction coping-upto their expectations.

Module I: Introduction to CRM- CRM Definitions, Emergence of CRM practice, CRM cycle, Stakeholders in CRM, Significance of CRM, Types of CRM, Success Factors in CRM, CRM Comprehension, CRM Implementation. **(12 Hrs)**

Module II: Customer Satisfaction-Meaning, Definition, Significance of Customer Satisfaction, Components of Customer Satisfaction, Customer Satisfaction Models, Rationale of Customer Satisfaction, Measuring Customer Satisfaction, Customer satisfaction and marketing program evaluation, Customer Satisfaction Practices**.**

(14 Hrs)

Module III: Emerging Perspectives: Rural CRM, customer relationship management practices in retail industry, hospitality industry, banking industry, telecom industry, aviation industry**.**

(10Hrs)

References

1. Alok Kumar Rai, “Customer Relationship Management-Concepts and Cases”, PHI Learning Pvt. Ltd, 2012.
2. Bhasin, “Customer Relationship Management”, Wiley Dream tech publishers, 2012 Alok Kumar Rai, “Customer Relationship Management-Concepts and Cases”, PHI Learning Pvt. Ltd, 2012.
3. Chaturvedi, “Customer Relationship Management”, Excel Books, 2009.
4. Sheth J N, Parvatiyar A. and Shainesh G,”Customer relationship management-
5. Emerging Concepts, Tools, & Applications”, Tata McGraw-Hill Education , 2009.

Marks including choice:

Module	Marks
I	10
II	12
III	8
Total	30

GENERIC ELECTIVE COURSE II: SERVICE MARKETING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D02BBA	2	2	2

Course Outcomes:

CO1: Appreciate the challenges facing the services marketing in traditional commercial marketing, e-marketing and non - commercial environments.

CO2: Identify the differences between marketing physical products and intangible services, including dealing with the extended services marketing mix, and the four unique traits of services marketing.

CO3: Recognise the challenges faced in services delivery as outlined in the services gap model.

CO4: Forecast the new innovations in the services industry and become the recipients of better services quality ensured by best corporates.

Module I: Introduction- Growth of service sector – Definition, features and types of services – designing of service – Service Marketing versus Goods Marketing- 7 P's Services Marketing Mix-- Service marketing triangle– Service mapping **.** **(10Hrs)**

Module II: Consumer Behaviour in Services Marketing-Customer expectation of services - Factors influencing customer expectation of services - Customer perception of services - Customer satisfaction **.** **(6Hrs)**

Module III : Management of Services Marketing- Service strategy for an effective demand – Service strategy for supply – market segmentation, Targeting and Positioning**.** **(8 Hrs)**

Module IV: Delivering Quality Services-Quality gap – the customer expectation vs. actual services – Technique to augment the gap – Performance gap – Promise vs. Delivery - Strategy for augmenting the gap – Communication gap—Measuring Service Quality: SERVQUAL Scale.

(12Hrs)

Reference Books

1. S.M. Jha, “Services Marketing” Himalaya Publishing House. 2017

2. Christopher Lovelock “Services Marketing” Pearson Education, 11th edition 2017

3. Adrian Payne, “The Essence Of Services Marketing” Prentice Hall of India Pvt Ltd., 2014.

4. B Santhanam, “Services Marketing” Margham Publications, 2014

5. K. Douglas, Hoffman, John E.G. Bate Son “Essentials of Service Marketing” Dryden Press Series, 2013.

6. Helen Woodroffe – “Services Marketing” Macmillan publications, 2012.

Marks including choice:

Module	Marks
I	8
II	5
III	7
IV	10
Total	**30**

GENERIC ELECTIVE COURSE III: E-COMMERCE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D03BBA	2	2	2

Course Outcomes:

CO1: Familiarize the basic concepts and methods of e-commerce

CO2 :Understand how e-commerce affect today's business world

CO3:Identify the precautionary measures to be followed while entering in online transactions.

CO4: Analyze factors influencing the success of e-commerce.

Module I; Introduction to e-commerce:- Meaning, Concept, Origin. Importance, features, benefits of e-commerce. Challenges and limitations of e-commerce**.** **(10Hrs)**

Module II: Business models of e-commerce:- B2B, B2C, C2C. Factors influencing the success of e-commerce. **(6 Hrs)**

Module III: Electronic payment systems:- Introduction, Online payment methods, Debit card, credit card, e-cash, e-smart card, e-cheque, e-wallet, stored value card (gift card), Electronic fund transfer(EFT), Digital currency, M-commerce. **(12Hrs)**

Module IV: Recent trends in e-commerce:- Digital signature, digital certificate, Biometrices Information & Technology Act 2000, Security issues in e-commerce.

(8Hrs)

References

1. Ashoke Ghose, Basics of E-commerce. Legal & Security Issues: NIIT Publisher

2 .Bejajnath E-commerce, The cutting Edge of Business

3. R Kalakota E-commerce

4. Douglas, The internet book

5. Aleon, Internet in a nutshell

6. Internet and web design. R&D Wing, Mac Million

7. Rayport, Jeffrey F and Jaworksi, Bernard J, Introduction to E-Commerce, Tata Mc Graw Hill, New Delhi

Marks including choice:

Module	Marks
I	8
II	5
III	10
IV	7
Total	30

GENERIC ELECTIVE COURSE IV: EVENT MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D04BBA	2	2	2

Course Outcomes:

CO1: Understand the concept and significance of event management.

CO2: Familiarize the techniques to improve event finance, sponsorship and cost control.

CO3 : Practice preparing time limits for event.

CO4: Develops skill for conducting an event

Module I: Introduction to Event Management: concepts – nature – scope – Evolution of professional event management- significance and components of events – event co ordination.

(8Hrs)

Module. II: Conceptualizing and designing Event: key elements of events – activities in event management – planning – organizing – staffing – leading – co ordination – controlling – event management information system.

(10Hrs)

Module. III

Event Production – Staging an event – choosing the event site – developing the theme – conducting rehearsals – providing services – arranging catering – inter personal skills. Event Marketing, Finance Management in events, Safety and security in event**.**

(10Hrs)

Module IV: Evaluation of Event Performance: basic evaluation process – measuring performance – formative evaluation – objective evaluation – summative evaluation – correcting deviations. **(8Hrs)**

References

1. Event Marketing and Management :Sanjaya Singh Gaur &Sanjay.V.Saggere
2. Successful event management : Anton Shorie, Bryn Parry
3. Event Management : A.K.Bhatia
4. Best Practices in Modern event Management : Gold Blatt
5. Professional Event co ordination : Julia Rutherford Silvers
6. Event Planning : Judy Allen
7. Hand book of conferences and meetings b y David seekin

<u>Marks including choice</u>:

Module	Marks
I	7
II	8
III	8
IV	7
Total	30

GENERIC ELECTIVE COURSE V: DISASTER MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D05BBA	2	2	2

Course Outcomes:

CO1: Understand the factors contributing to disaster

CO2: Acquire knowledge about the various precautionary measures to reduce the disasters

CO3: Understand the IT techniques in disaster management

CO4 : Identify the role of NGO and Govt. in disaster management

Module I: Disaster:- Meaning, Definition, Phases of disaster. Classification of disaster:- Natural- Flood, Cyclone, Earthquake, Landslide; Man-made- Fire, Pollution, Nuclear disaster, Biological disaster (Causes & effects) **(12 Hrs)**

Module II: Vulnerability Analysis:- Vulnerability:- meaning, concept. Strategic development for vulnerability analysis. Disaster Risk Reduction (DRR) **(6Hrs)**

Module III: Disaster Management: Pre disaster prevention, Prediction. Disaster preparedness-disaster preparedness plan; long term and short term.Warnings, safety measures. Post disaster management:- Damage assessment, remedial measures, rehabilitation**.**

(12Hrs)

Module IV: Role of IT in disaster management: Role of Govt. NGO, Volunteers and social workers in disaster management. **(6Hrs)**

References

1. R.B Singh(Ed) :Disaster Management, Rawat Publications, New Delhi

2. H.K Gupta(Ed) :Disaster Management, Universiters Press, India:

3. R.B Singh : Space Technology for Disaster Mitigation in India (INCED), University of Tokyo

4. Dr. Satender :Disaster Management in Hills, Concept Publishing Co., New Delhi

5. M.C Gupta : Manuals on Natural Disaster Management in India, National Centre for Disaster Management, IIPA, New Delhi.

6. R.K Bhandani : An Overview on Natural and Manmade Disaster & their 44 Reduction, CSIR, New Delhi.

7. R.B Singh(Ed) :Environmental Geography, Heritage Publishers, New Delhi.

Marks including choice:

Module	Marks
I	10
II	5
III	10
IV	5
Total	30

MODEL QUESTION PAPERS
I SEMESTER BBA DEGREE PROGRAMME
CORE COURSE I - 1B01BBA(BBA)
PRINCIPLES AND PRACTICE OF MANAGEMENT

Time : 3 Hours **Maximum : 40 Marks**

PART – A

Answer all questions. Each question carries 1 mark.

1. What is planning premises?
2. What is departmentation?
3. Define management?
4. What is strategy?
5. What is MBO?
6. What is motivation? (6×1=6)

PART - B

Answer any 6 questions. Each question carries 2 marks.

7. What is diagonal communication?
8. What is span of supervision?
9. What is gangplank?
10. What do you mean by synergy?
11. What is centralization?
12. Explain the concept of stability of tenure?
13. What is standing plan?
14. What do you mean by science not rule of thumb method? (6×2=12)

PART - C

Answer any 4 questions. Each question carries 3 marks.

15. Explain the different types of decision making?
16. Difference between centralization and decentralization?
17. Explain the principles of organizing?
18. “Planning and controlling are the two sides of the same coin”. Do you agree?
19. “Coordination is the essence of management” Explain?
20. What is staffing? Explain the steps in staffing? (4×3=12)

PART – D

Answer any 2 questions. Each question carries 5 marks.

21. What is directing? What are the elements of directing?
22. What do you mean by controlling? What are the techniques of controlling?
23. Explain the elements of scientific management?
24. What are the different types of organizing? (2×5=10)

I SEMESTER BBA DEGREE PROGRAMME
COMPLEMENTARY ELECTIVE COURSE I–1C01BBA (BBA)
STATISTICS FOR BUSINESS DECISIONS

Time : 3 Hours **Maximum : 40 Marks**

PART – A

Answer all questions. Each question carries 1 mark.

1. What is primary data?
2. Define correlation
3. What is regression?
4. What is Questionnaire?
5. What is secular trend?
6. What is price index? (6×1=6)

PART - B

Answer any 6 questions. Each question carries 2 marks.

7. What do you mean by tabulation?
8. Define statistics
9. List out different methods of collection of primary data?
10. Explain the types of index numbers.
11. What is perfect correlation?
12. What do you mean by regression coefficients?
13. What are the components of time series?
14. What is scatter diagram? (6×2=12)

PART - C

Answer any 4 questions. Each question carries 3 marks.

15. What are the main uses of index numbers?
16. Difference between classification and tabulation?
17. State the merits and demerits of Spearman’s rank correlation method?
18. Explain moving average

19. What are the functions of statistics?
20. Explain cost of living index (4×3=12)

PART – D

Answer any 2 questions. Each question carries 5 marks.

21. What is meant by statistical investigation? What are the stages of statistical investigation?
22. Calculate Karl Pearson's coefficient of correlation for the following series

Price(In Rs) :	110	111	112	113	114	115	116	117	118	119
Supply(In Kg):	200	210	210	240	260	280	310	400	410	420

23. Define trend. What are the various methods used to measure trend?
24. Compute Fishers ideal index and show whether it satisfies Time reversal test.

Commodity	Base Year		Current Year	
	P	Q	P	Q
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24

(2×5=10)

I SEMESTER BBA DEGREE PROGRAMME
COMPLEMENTARY ELECTIVE COURSE II – 1C02BBA
MANAGERIAL ECONOMICS

Time : 3 Hours **Maximum : 40 Marks**

PART A

Answer all questions. Each question carries 1 mark

1. Define managerial economics.
2. What is kinked demand curve?
3. What is price differentiation?
4. Define opportunity cost.
5. Define production function.
6. What is supply? (6x1=6)

PART B

Answer any 6 questions. Each question carries 2 marks

7. What is price skimming?
8. What is selling cost?
9. What is cost plus pricing? State its advantages.
10. What is law of demand?
11. What are the properties of an isoquant curve?
12. Give the meaning of equilibrium?
13. What is substitution effect?
14. What is diminishing marginal utility? (6x2=12)

PART C

Answer any 4 question. Each Question carries 3 marks

15. Distinguish between fixed cost and variable costs.
16. Explain the features of long run average cost.
17. Explain any three pricing methods.
18. Explain the features of perfect competition.
19. Explain supply curve.
20. Explain price elasticity of demand. (4x3=12)

PART D

Answer any 2questions. Each question carries 5 marks

21. Explain with suitable examples, the various determinants of demand.
22. Define monopoly. Explain how price output decisions are taken under conditions of monopoly.
23. Explain the nature and scope of managerial economics.
24. Explain cost output relationship in short run. (5x2=10)

II SEMESTER BBA DEGREE PROGRAMME
CORE COURSE II - 2B02BBA
BUSINESS ENVIRONMENT

Time : 3 Hours **Maximum : 40 Marks**

PART A

Answer all questions. Each question carries 1 mark

1. Define business environment
2. What is legal environment
3. What is disinvestment
4. What is an MNC
5. What is public sector Enterprise
6. Expand CSR (6x1=6)

PART B

Answer any 6 questions. Each question carries 2 marks

7. What is franchising
8. What are political institutions in India
9. What is SWOT analysis
10. What is environmental scanning
11. What is Globalization
12. What is industrial pollution
13. What is New Economic policy
14. What is sub culture (6x2=12)

PART C

Answer any 4 question. Each Question carries 3 marks

15. Explain the features of business environment
16. Explain micro environment factors
17. Explain the role of MNC in India
18. What are the elements in Socio cultural environment
19. Explain the Criticisms of disinvestment policy
20. What are the responsibilities of business towards Government (4x3=12)

PART D

Answer any 2questions. Each question carries 5 marks

21.What is business environment. What are the components of external environment

22. Explain the social responsibility of business towards different stakeholders

23. What are the main global entry strategies in globalization

24. What is environmental scanning. What techniques used in environmental scanning(5x2=10)

II SEMESTER BBA DEGREE PROGRAMME
CORE COURSE III - 2B03BBA
ENTREPRENEURSHIP DEVELOPMENT

Time : 3 Hours **Maximum : 40 Marks**

PART A

Answer all questions. Each question carries 1 mark

1. Define Entrepreneurship?
2. What do you mean by project management?
3. What is flexibility study?
4. What do you mean by intrapreneurs?
5. What do you mean by small scale industry?
6. What do you mean by viability study? (6 x1=6)

PART B

Answer any 6 questions. Each question carries 2 marks

7. Describe features of entrepreneurship.
8. Explain EDP
9. Explain venture capital
10. What are the problems faced by women entrepreneur?
11. State relationship between Entrepreneurial behavior and psycho theories.
12. Explain the role of Govt. in organizing EDP
13. Describe theories of entrepreneurship.
14. How employment opportunities are generated by entrepreneurship? (6x2=12)

PART C

Answer any 4 question. Each Question carries 3 marks

15. Write a note on Women Entrepreneurs.
16. Explain the functions of Entrepreneurs
17. Distinguish between Entrepreneurs and managers
18. Describe any two state level financing institutions.
19. What is the difference between Intrapreneurs and entrepreneurs?
20. Describe any four types of Entrepreneurs. (4x3=12)

PART D

Answer any 2questions. Each question carries 5 marks

21. Write a note on rural entrepreneurship
22. Explain status of entrepreneurship in Indian industry with examples
23. Describe various stages of project management.
24. Explain women entrepreneurship in India (5x2=10)

II SEMESTER BBA DEGREE PROGRAMME
CORE COURSE III - 2C03BBA
QUANTITATIVE TECHNIQUES FOR BUSINESS DECISIONS

Time: 3 hrs **Max Marks: 40**

Section A

Answer all questions. Each question carries 1 mark

1. Define Mutually Exclusive Events
2. What is Type I error?
3. What is standard normal variate?
4. What is a random experiment?
5. Define exhaustive events
6. What are equally likely events? **(6 x1=6)**

SECTION B

Answer any SIX questions. Each question carries 2 marks

7. Explain Two-Tailed Test
8. Write the characteristics of normal curve
9. What do you mean by parametric test and non parametric test?
10. What is the probability of getting a king or spade when you are drawing a card from a pack of 52 cards?
11. Describe the utilities of poisson probability distribution.
12. Explain Level of Significance
13. Give the characteristics of the Normal Distribution
14. Explain Poisson Distribution as a limiting case of Binomial Distribution. **(6 x 2 = 12)**

SECTION C

Answer any FOUR questions. Each question carries 3 marks

15. Explain the uses of quantitative techniques in business and industry
16. What is conditional probability. If P(A) = 0.4, P(B) = 0.8, P(A intersection B) = 0.06, Find
    PA/B) & P B/A)
17. A basket contains 20 bad & 60 good apples. Four apples are drawn from this basket. Find the probability that of four a) at least 2 are good apples, b) utmost 2 are good apples
18. A car hire firm has two cars which it hires out day by day. The number of demands for a car on each day is distributed as a poison distribution with mean 1.5. Calculate the proportion of day on which a) neither car is used, b) some demand is refused
19. The variable X follows a normal distribution with mean 45 and SD 10. Find the probability for an item to fall a) beyond 60 b) between 40 and 56.

20. In a competitive examination, 5000 students have appeared for a paper in Maths. Their average mark was 62 and SD was 12. If there are only 100 vacancies, find the minimum marks that one should secure to get selected against a vacancy. **(4 X 3 = 12)**

SECTION D

Answer any TWO questions. Each question carries 5 marks

21. In a competitive examination, 5000 students have appeared for a paper in statistics. Their average mark was 62 and standard deviation was 12. If there are only 100 vacancies, find the minimum marks that one should secure to get selected against a vacancy.
22. What is Hypothesis Testing and explain the procedure for testing of hypothesis
23. Eight coins are tossed together 256 times. Fit a binomial distribution and find the expected frequencies of heads. Also find Mean and Standard Deviation.
24. An Urn A contains 2 white and 4 black balls. Another Urn B contains 5 white and 7 black balls. A ball is transferred from the Urn A to Urn B. Then a ball is drawn from Urn B. Find the probability that it will be white. **(2 X 5 = 10)**

KANNUR UNIVERSITY

(Abstract)

Bachelor of Computer Application (BCA) Programme- Scheme, Syllabus and Pattern of Question Papers of Core and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/12371/2019/i Civil Station P.O, Dated 21/06/2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated 10-10-2017

2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.

3. U.O No.Acad.C2/429/2017 Vol.II dated 03-06-2019

4. The Minutes of the meeting of the Board of Studies in Computer Science (UG) held on 07-06-2019

5. Syllabus of Bachelor of Computer Application (BCA) submitted by the Chairperson, Board of Studies in Computer Science (UG) dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies , Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Computer Science (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core & Generic Elective of Bachelor of Computer Application (BCA) Programme to be implemented with effect from 2019 Admission.

--2

5. As per paper read (5) above, the Chairperson, Board of Studies in Computer Science (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of Bachelor of Computer Application (BCA) Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core /Generic Elective Course) of Bachelor of Computer Application (BCA)programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to report before the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of Bachelor of Computer Application (BCA) Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To

The Principals of Colleges offering BCA
(Bachelor of Computer Application programme)

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Computer Science (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES-COMPUTER SCIENCE (UG)

SYLLABUS FOR BACHELOR OF COMPUTER APPLICATIONS(B C A) COREAND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTERSYSTEM
(OBE-Outcome Based Education System)

(2019 ADMISSION ONWARDS)

Kannur University
Vision and Mission Statement

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manantavadytaluk of Wayanad Revenue District"

Mission:

- To produce anddisseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

Programme Outcomes (PO)

PO 1.Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminationsand empathetic social awareness about various kinds of marginalization.
3. Internalize certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernization of the post-colonial society.

PO 3.Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The Board of Studies in Computer Science bears deep academic venture and curriculum vision in forming the syllabus for undergraduate programme of Kannur University. The curriculum and syllabus pinpoint the creation of technical caliber of students through class room learning, workshops, seminars, presentations and summative and formative assessments.

As the present era moves with advancements in Science and Technology, the Board of Studies in computer Science of Kannur University predominantly emphasize employment-based curriculum formation to make the students extremely competent in global scenario.

Recent algorithms, Networks, Operating Systems etc. are the crux of vast developing technical dimensions of the computer science and Engineering. This curriculum and syllabus clearly states the graduate attributes/Outcomes and is developed after numerous workshops and discussions with different stakeholders.The Board of Studies in Computer Science has resolved to introduce the syllabus in the affiliated colleges for UG programme from 2019 admission onwards.I place records of gratitude to the members of board of studies,Faculties and stake holders to help me in the formation of syllabus.

Lt.ThomasScaria

Chairperson

Board of Studies, Computer Science (UG)
Kannur University

KANNUR UNIVERSITY

Programme Specific Outcome of B.Sc. Computer Science Programme

PSO1	Understand the concepts of Computer Science and Applications.
PSO2	Understand the concepts of System Software and Application Software.
PSO3	Understand the concepts of Algorithms and Programming.
PSO4	Understand the concepts of Computer Networks.
PSO5	Design, develop, implement and test software systems to meet the given specifications, following the principles of Software Engineering.

KANNUR UNIVERSITY

BCA PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common Course – English I	4	5	19	25
	Common Course – English II	3	4		
	Common Course – Additional Language I	4	5		
	General Awareness Course I – 1A11BCA Informatics for Computer Applications	2	3		
	Core Course I – 1B01BCA Programming In C	2	2		
	Core Course IV – 2B04BCA Lab I: Programming In C*	0	2		
	Complementary Elective (Mathematics I)	4	4		
II	Common Course – English III	4	5	22	25
	Common Course – English IV	3	4		
	Common Course – Additional Language II	4	5		
	Core Course II – 2B02BCA Digital Systems	3	3		
	Core Course III – 2B03BCAObject Oriented Programming Using C++	2	2		
	Core Course IV – 2B04BCA Lab I: Programming In C*	1	0		
	Core Course V – 2B05BCA Lab II: Programming In C++*	1	2		
	Complementary Elective (Mathematics II)	4	4		
III	General Awareness Course II – 3A12BCA Data Structures	4	4	18	25
	General Awareness Course III – 3A13BCA Database Management System	4	4		
	Core Course VI – 3B06BCAIntroduction to Microprocessors	3	4		
	Core Course VII – 3B07BCAJava Programming	3	4		
	General Awareness Course V – 4A15BCA Lab III: Data Structure and DBMS**	0	3		
	Core Course XI – 4B11BCA Lab IV: Java Programming, Shell Programming & Linux Administration**	0	2		
	Complementary Elective (Mathematics III)	4	4		

IV	General Awareness Course IV – 4A14BCA Discrete Mathematical Structures	4	4	21	25
	Core Course VIII – 4B08BCA Operating Systems	3	4		
	Core Course IX – 4B09BCAComputer Organization	3	4		
	Core Course X – 4B10BCA Linux Administration	3	4		
	General Awareness Course V – 4A15BCA Lab III: Data Structure and DBMS**	2	2		
	Core Course XI – 4B11BCA Lab IV: Java Programming, Shell Programming & Linux Administration **	2	3		
	Complementary Elective (Mathematics IV)	4	4		
V	Core Course XII – 5B12BCASoftware Engineering	3	3	16	25
	Core Course XIII – 5B13BCAEnterprise Java Programming	4	4		
	Core Course XIV – 5B14BCA- Python Programming	2	2		
	Core Course XV – 5B15BCAWeb Technology	2	2		
	Core Course XVI – 5B16BCA Discipline Specific Elective I	3	4		
	Core Course XXI– 6B21BCA Lab V: Enterprise Java Programming***	0	3		
	Core Course XXII– 6B22BCA Lab VI: Python Programming***	0	3		
	Core Course XXIII– 6B23BCA Lab VII: Web Technology***	0	2		
	General Elective Course	2	2		
VI	Core Course XVII – 6B17BCA Design and Analysis of Algorithm	4	4	24	25
	Core Course XVIII – 6B18BCA Introduction to Compiler	3	4		
	Core Course XIX – 6B19BCA Data Communication & Networks	3	3		
	Core Course XX – 6B20BCA Discipline Specific Elective II	3	3		
	Core Course XXI– 6B21BCA Lab V: Enterprise Java Programming***	2	2		
	Core Course XXII– 6B22BCA Lab VI: Python Programming***	3	2		
	Core Course XXIII– 6B23BCA Lab VII: Web Technology***	2	2		
	Core Course XXIV – 6B24BCA Project	4	5		
Total				120	150

*External examination will be conducted at the end of second semester

**External examination will be conducted at the end of fourth semester

***External examination will be conducted at the end of sixth semester

Complementary Elective: Mathematics

Total Marks of the Programme- 1850 Marks (Eng 200 Marks, Additional Common Course 100 Marks, Core 1350, Complementary Elective 200 Marks)

PART A

BCACORE COURSES
WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS (INTERNAL + EXTERNAL)
1A11BCA	INFORMATICS FOR COMPUTER APPLICATIONS	1	3	2	3	10+40
1B01BCA	PROGRAMMING IN C	1	2	2	3	10+40
2B02BCA	DIGITAL SYSTEMS	2	3	3	3	10+40
2B03BCA	OBJECT ORIENTED PROGRAMMING USING C++	2	2	2	3	10+40
2B04BCA	LAB I: PROGRAMMING IN C	2	I SEM 2 II SEM 0	1	3	5+20
2B05BCA	LAB II: PROGRAMMING IN C++	2	2	1	3	5+20
3A12BCA	DATA STRUCTURES	3	4	4	3	10+40
3A13BCA	DATABASE MANAGEMENT SYSTEM	3	4	4	3	10+40
3B06BCA	INTRODUCTION TO MICROPROCESSORS	3	4	3	3	10+40
3B07BCA	JAVA PROGRAMMING	3	4	3	3	10+40
4A14BCA	DISCRETE MATHEMATICAL STRUCTURES	4	4	4	3	10+40
4B08BCA	OPERATING SYSTEMS	4	4	3	3	10+40
4B09BCA	COMPUTER ORGANIZATION	4	4	3	3	10+40
4B10BCA	LINUX ADMINISTRATION	4	4	3	3	10+40
4A15BCA	LAB III: DATA STRUCTURES AND DBMS	4	III SEM 3 IV SEM 2	2	3	5+20
4B11BCA	LAB IV: JAVA PROGRAMMING, SHELL PROGRAMMING & LINUX ADMINISTRATION	4	III SEM 2 IV SEM 3	2	3	5+20
5B12BCA	SOFTWARE ENGINEERING	5	3	3	3	10+40
5B13BCA	ENTERPRISE JAVA PROGRAMMING	5	4	4	3	10+40
5B14BCA	PYTHON PROGRAMMING	5	2	2	3	10+40
5B15BCA	WEB TECHNOLOGY	5	2	2	3	10+40
5B16BCA	DISCIPLINE SPECIFIC ELECTIVE I	5	4	3	3	10+40
5D--BCA	GENERIC ELECTIVE COURSE	5	2	2	2	5+20

6B17BCA	DESIGN AND ANALYSIS OF ALGORITHM	6	4	4	3	10+40
6B18BCA	INTRODUCTION TO COMPILER	6	4	3	3	10+40
6B19BCA	DATA COMMUNICATION & NETWORKS	6	3	3	3	10+40
6B20BCA	DISCIPLINE SPECIFIC ELECTIVE II	6	3	3	3	10+40
6B21BCA	LAB V: ENTERPRISE JAVA PROGRAMMING	6	V SEM 3 VI SEM 2	2	3	5+20
6B22BCA	LAB VI: PYTHON PROGRAMMING	6	V SEM 3 VI SEM 2	3	3	5+20
6B23BCA	LAB VII: WEB TECHNOLOGY	6	V SEM 2 VI SEM 2	2	3	5+20
6B24BCA	PROJECT	6	5	4	-	20+80
*AN INDUSTRIAL VISIT (STUDY TOUR) IS RECOMMENDED FOR THE PROJECT WORK						

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS
5B16BCA-E01	INFORMATION SECURITY	5	4	3	3
5B16BCA-E02	MOBILE COMMUNICATIONS	5	4	3	3
5B16BCA-E03	C# AND .NET PROGRAMMING	5	4	3	3
5B16BCA-E04	BIO-INFORMATICS	5	4	3	3
6B20BCA-E01	DATA MINING AND DATA WAREHOUSING	6	3	3	3
6B20BCA-E02	NETWORK PROGRAMMING	6	3	3	3
6B20BCA-E03	DIGITAL IMAGE PROCESSING	6	3	3	3
6B20BCA-E04	CLOUD COMPUTING	6	3	3	3

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS INTERNAL ASSESSMENT FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	80%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE MARKS OBTAINED IN THE TESTS CONDUCTED.
COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	20%	ANY ONE COMPONENT

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**Short Answer**	**6 Questions x 1 Mark = 6 Marks**
	Answer all questions	6 Questions x 1 Mark = 6 Marks
Part B	**Short Essay**	**8 Questions x 2 Marks = 16 Marks**
	Answer any 6 questions	6 Questions x 2 Marks = 12 Marks
Part C	**Essay**	**6 Questions x 3 Marks = 18 Marks**
	Answer any 4 questions	4 Questions x 3 Marks = 12 Marks
Part D	**Long Essay**	**4 Questions x 5 Marks = 20 Marks**
	Answer any 2 questions	2 Questions x 5 Marks = 10 Marks
Total Marks Including Choice: 60		
Maximum Marks for the Course: 40		

CONTINUOUS EVALUATION FOR PRACTICAL

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1: LAB SKILLS, OBSERVATION NOTE AND PUNCTUALITY	20% FOR LAB SKILL 20% FOR OBSERVATION NOTE AND PUNCTUALITY	OBSERVATION NOTE IS MANDATORY. MARKS SHOULD BE GIVEN CONSIDERING OBSERVATION NOTE LAB SKILLS AND PUNCTUALITY.
COMPONENT1: TEST	60%	MODEL EXAMINATION SHOULD BE CONDUCTED BEFORE EXTERNAL EXAM AND CONSIDERED FOR INTERNAL MARK

END SEMESTER EVALUATION FOR PRACTICAL

***EXCEPT : 2B04BCA PROGRAMMING IN C- LAB**

COMPONENT	PART A	PART B
Code Writing	3	3
Output	3	3
Modification for Part A or Part B	3	
Record	2	
Viva	3	
Total Marks	**20**	

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Part B	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Total Marks Including Choice: 40		
Maximum Marks for the Course: 20		

SEMINARS/ASSIGNMENTS/VIVA

These are part of the curriculum and are to be critically assessed for Internal Assessment. Marks should be awarded based on the content, presentation and the effort put in by the student. The course teacher may give the topics for seminars / assignments. The topics shall be related to the syllabus of the course and is not meant for evaluation in the End Semester Examination.

RECORDS

One rough record (Observation Note) and one fair record are compulsory for each practical course. The student will not be permitted to appear for practical examinations without certified practical records. The records are intended as observation records of the practical works done in the lab. The valuation of records, to be done internally, should be based on the effort and promptness of the student in practical works. Record mark is calculated at the time of End Semester Evaluation. Observation notes are compulsory in Lab hours.Students should get signature for each program done in the lab from the faculties and those programs are recommended for fair record.

PROJECT WORK

Every student of B.Sc. Computer Science Programme shall have to work on a project of FIVE credits under the supervision of a faculty member as per the curriculum. The duration of the project is one year, starting in the fifth semester and submission of the dissertation at the end of sixth semester. Individual projects are recommended but, in an instance, where the number of supervising teachers is less, the project may be done as group. The maximum number of students in a group shall be limited to THREE.

PROJECT EVALUATION

Evaluation of the Project Work shall be done under Mark System at two stages:

1. Internal Assessment (supervising teachers will assess the project and award internal Marks)
2. External evaluation (external examiner appointed by the University)

Marks secured for the project will be awarded to candidates, combining the internal and external Marks. Assessment of different components may be taken as below.

CONTINUOUS EVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Punctuality	20%
Relevance of topic System study / Design of tables	20%
Project Report	30%
Presentation & Viva-voce	30%
Total	**100%**

END SEMESTEREVALUATION FOR PROJECT

COMPONENT	WEIGHTAGE
Written Synopsis/Abstract	12.5%
Content of the Project	12.5%
Quality of project work/Useof software/ tools	12.5%
Perfection of the work (Designs of tables/ Input & Output forms)	25%
Live demo	12.5%
Viva-voce	25%
Total	**100%**

GENERAL AWARENESS COURSE I: 1A11BCA INFORMATICS FOR COMPUTER APPLICATIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1A11BCA	3	2	3

COURSE OUTCOME

CO1: Understand the basic concepts and functional knowledge in the field of Informatics.
CO2: Equip the students with fundamentals of Computer.
CO3: Awareness about social issues and concerns in the use of digital technology
CO4: Skills to enable students to use free software.

Unit I:

Concept of Hardware and Software: Computer Languages – Machine Language, Assembly Language, High-level Language, Language translators: Compiler, Interpreter, Assembler, Features of good language.

(12Hrs)

Unit II:

Basic Computer Organization: Von Neumann model, Input Unit, Output Unit, Storage Unit, Control Unit, Memory hierarchy, RAM, ROM, PROM and EPROM, cache memory and registers. Secondary storage devices. Storage capacity: bit, byte, nibble.

(10Hrs)

Unit III:

Introducing Input output devices with examples. Introduction to operating System: need of OS, Types of OS, Functions of OS (introduction only). Introduction to Computer Networks: definition and applications.

(12Hrs)

Unit IV:

Introduction to Linux: Basic commands in Linux such as listing files, viewing contents in files, creating and deleting directories, moving and copying files and/or directories, man pages, setting permissions on files/directories and vi editor. Steps to install Linux OS.

(10Hrs)

Unit V:

IT & Society- issues and concerns- digital divide, IT & development, free software movement, cyber ethics, cybercrime, cyber threats, cyber security, privacy issues, cyber laws, cyber addictions, guide lines for proper usage of computers, internet and mobile phones.

(10Hrs)

Books for Study:

1. V. Rajaraman and T. Radhakrishnan, An Introduction to Digital Computer Design, 5th Ed, PHI.
2. B.Ram, Computer Fundamentals, Architecture & Organization, 4th Ed, New Age International Publishers
3. Pradeep K. Sinha and Priti Sinha, Computer Fundamentals, 6th Ed, BPB Publications
4. Ellen Siever, Stephen Figgins, Robert Love and Arnold Robbins, Linux in a Nutshell: A Desktop Quick Reference, 6thEdition, O′Reilly

Books for Reference:

1. George Beekman and Eugene J. Rathswohl, Computer Confluence, Pearson
2. Alexis Leon and Mathews Leon, Fundamentals of Information Technology, Vikas Publishing
3. Barbara Wilson, Information Technology: The Basics, Macmillan International Higher Education
4. John Ray, Sams Teach Yourself Linux in 10 Minutes, Sams
5. Ramesh Bangia, Learning Computer Fundamentals, Khanna Publishers

Marks including choice:

Unit	**Marks**
1	12
2	12
3	12
4	12
5	12

CORE COURSE I: 1B01BCA PROGRAMMING IN C

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1B01BCA	2	2	3

COURSE OUTCOME

CO1: Understanding the basic concepts inprogramming.
CO2: Familiarize the basic syntax and semantics of C language.
CO3: Familiarize with advanced features ofc.
CO4: Develop skill inprogramming

Unit I:

Algorithms and Flow charts: Definitions, Symbols, Program:structure, top-down design, source code, object code, executable file, file extensions. Importance of C; Basic structure of C, programming style, executing a C program. Character set, C tokens, Keywords, identifiers, Constants, data types, declaration of variables, arithmetic operators , logical operators, Relational operators, Assignment operators, Increment and decrement operators, conditional operators, Bitwise operators. Precedence and order of evaluation. type conversion in expression. common programming errors, program testing and debugging, programefficiency.

(9 Hrs)

Unit II:

Managing Input output operation: reading a character, writing a character, formatted input output. Branching statements-if, if..else, nested if...else, else...if ladder, switch statement, go to statement. Looping statements- while, do...while, for loop. Break and continue statements.

(7 Hrs)

Unit III:

Arrays: One dimensional arrays, two dimensional arrays, Initializing array elements, Multidimensional arrays. Strings: declaration and initializing, reading and writing. Arithmetic operations on character. String handling functions, Functions: Library and user defined, defining a function, calling a function. Parameter passing techniques, Scope and life time of variables in function, recursive functions, arrays andfunctions.

(7 Hrs)

Unit IV:

Structure and union: definition, giving values to members, initialization. Array of structures, array within structure, structure within structure, union. Pointers: accessing the address of a variable, declaration and initializing pointers, accessing a variable through its pointers, pointer arithmetic, pointers and arrays (pointer to array and array of pointers), pointers and character string, pointer and functions. Dynamic memory allocation: malloc(), calloc(), free(),realloc().

(6 Hrs)

Unit V:

File Management: Text and binary files, Defining and opening a file, closing a file, input and output operations on file, error handling, random access file. Command line arguments.

(7 Hrs)

Books for Study:

1. E. Balaguruswamy, Programming in ANSI C, 7th Ed, TMH

Books for Reference:

1. V. Rajaraman, Computer Basics and C Programming, PHI
2. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson
3. Yeshavant Kanetkar, Let Us C, 16thEd, BPB
4. Noel Kalicharan, C by Example, Cambridge University Pres

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE II: 2B02BCA DIGITAL SYSTEMS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B02BCA	3	3	3

COURSE OUTCOME

CO1: Introduce the basic and important concepts of Digital Principles and applications
CO2: Familiarize with basic building blocks of Digital systems, Digital Logic and Digital Circuits
CO3: Design simple combinational digital systems.
CO4: Familiarize different number systems, codes and data representation in digital systems

Unit I:

Introductory Digital Concepts: Digital and Analog Quantities – Binary Digits, Logic Levels and Digital Waveforms - Basic Logic - Digital IC. Number Systems: Decimal, Binary, Hexa-decimal and Octal – Conversions -CODES: BCD,ASCII, Excess-3, GRAY and UNICODE. BINARY ARITHMETIC: Addition, Subtraction. Data Representation(textbook 2): Data types - Complements (1's and 2's)– FixedPoint representation – Floating Point representation.

(10 Hrs)

Unit II:

Logic Gates: Inverter-AND-OR-NAND-NOR-XOR-XNOR-positive and Negative logic-Examples of IC gates. Boolean Algebra and Logic simplification: Boolean operations and Expressions – Laws and Rules of Boolean Algebra – DeMorgan's Theorem – Boolean analysis of Logic Circuits – Simplification, Standard forms and Truth tables of Boolean Expressions – K-Map , SOP, POS Minimization.

(12 Hrs)

Unit III:

Combinational Logic Circuits: Basic Combinational Logic Circuits – Implementing Combinational Logic – Universal Property of NAND and NOR gates. Functions of Combinational Logic: Basic overview – Basic Adders-Parallel Binary Adders-

Comparators-Decoders-Encoders-Code Converters – Multiplexers – Demultiplexers-Parity generators/checkers.

(12 Hrs)

Unit IV:

Flip Flops: Latches – Edge triggered Flip flops – Master Slave Flip flops-operating characteristics. Counters: Asynchronous counters - Synchronous counters – UP/Down synchronous counters – Design of Synchronous counters

(10Hrs)

Unit V:

Shift Registers: Basic Shift Registers Functions - Serial in/Serial Out Shift Registers - Parallel In/Parallel out Shift Registers Bidirectional Shift Registers – Shift Register Counters. Memory: Basics of Semiconductor memories – RAM – ROM – PROM – EPROM – Flash Memories

(10 Hrs)

Books for Study:

1. Thomas L. Floyd, Digital Fundamentals, 11th Ed, Pearson
2. M. Morris Mano, Computer System Architecture, 3rd Ed, Pearson

Books for Reference:

1. Donald P. Leach, Albert Paul Malvino and Gautam Saha, Digital Principles and Applications, 8th Ed, TMH

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE III: 2B03BCA OBJECT ORIENTED PROGRAMMING USING C++

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B03BCA	2	2	3

COURSE OUTCOME

CO1: Understanding OOPsconcepts such as inheritance and polymorphism and their implementation usingC++.
CO2: Ability to develop programs in C++

Unit I:

Principles of object-oriented programming; OOP paradigm; Basic concepts of OOP; Benefits; applications. Introduction to C++, Structure of C++ program; Tokens, Keywords, identifiers and constants; Data types, symbolic constants; type compatibility; declaration and dynamic initialization of variables; reference variables. Operators, manipulators; type cast operators; Expressions, implicit conversions; operator overloading; operator precedence; Control structures.

(9Hrs)

UnitII:

Functions; function overloading; friend and virtual functions; Math library functions. Structures; Specifying a class; Defining member functions; making an outside function inline; nesting of member functions; private member functions; arrays within a class; memory allocation for objects; static data members; static member functions; arrays of objects; objects as function arguments; friendly functions; returning objects; const member functions; pointer to members; Localclasses.

(7 Hrs)

Unit III:

Constructors and destructors; dynamic initialization of objects; copy constructor; Dynamic constructors; const objects; Destructors. Operator overloading – definition; overloading unary operators; overloading binary operators; overloading binary operators using friends; manipulation of strings using operators; rules for overloading operators. Type conversions.

(7 Hrs)

Unit IV:

Inheritance – defining derived classes; making a private member inheritance; Types of inheritance; virtual base classes; abstract classes; constructors in derived classes; Nesting of classes. Pointers; Pointers to objects; Pointers to derived classes; virtual functions; pure virtualfunctions.

(6 Hrs)

Unit V:

C++ streams; stream classes; unformatted I/O operations; Formatted console I/O operations; Managing output with manipulators. Files – classes for file stream operations; Opening and closing a file; file modes; file pointers and their manipulations; Sequential input and output operation.

(7 Hrs)

Books for Study:

1. E. Balagurusamy, Object Oriented Programming with C++, 7th Ed, TMH

Books for Reference:

1. K R. Venugopal and Raj Kumar Buyya, Mastering C++, 2ndEd, TMH.
2. Ashok N. Kamthane, Object-Oriented Programming with ANSI and Turbo C++, Pearson
3. M. T. Somashekara, Programming in C++, 2009, PHI
4. Yeshavant Kanetkar , Let us C++, 2nd Ed, BPB

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE IV: 2B04BCA LAB I - PROGRAMMING IN C

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B04BCA	I SEM 2 Hrs II SEM 0 Hrs	1	3

Sample Program List

Students have to practice all programs

1. Write a program to print the size of any five data types in C and its range.
2. Write a program to convert Fahrenheit to Celsius.
3. Write a program to accept three numbers and find the largest and second largest (if stmt)
4. Write a program to to find the roots of a quadratic equation (if stmt)
5. Write a program to print all prime numbers between any 2 given limits. (while/for stmt)
6. Write a program to check whether a given matrix is an Identity matrix or not. (2D array)
7. Write a program matrix multiplication. (2D array)
8. Write a program to accept two numbers and perform various arithmetic operations (+,-,*,/) based on the symbol entered. (switch stmt)
9. Write a recursive program to find the factorial of a number.(recursive function)
10. Write a program to check whether the string is a Palindrome. (string, 1D array)
11. Write a program to count and display the different vowels in a line of text. (string)
12. Create an employee structure and display the same. (structure)
13. Write a function to swap two numbers using pointers (pointers, call by value, call by ref)
14. Write a program to access an array of integers using pointers (pointers to arrays)
15. Create a file and store some records in it. Display the contents of the same.(file)

DISTRIBUTION OF MARKS FOR END SEMESTER EVALUATION

COMPONENT	**PART A**	**PART B**
Code Writing	3	3
Output	3	3
Modification for Part A or Part B	2	
Algorithm/Flowchart for part A or Part B	2	
Record	1	
Viva	3	
Total Marks	20	

PATTERN OF QUESTION PAPER FOR END SEMESTER EVALUATION

Part A	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Part B	**2 Questions x 10 Mark = 20 Marks**	
	Answer any 1 question	1 Questions x 10 Mark = 10 Marks
Total Marks Including Choice: 40		
Maximum Marks for the Course: 20		

CORE COURSE V: 2B05BCA LAB II - PROGRAMMING IN C++

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B05BCA	2	1	3

Sample Program List

Students have to practice all programs and record a minimum 15 programs. All programs must be based on OOP concepts.

1. Program to find the factorial of a number usingrecursion.
2. Program to find whether the given number belongs to Fibonacci series.
3. Program to find whether the string is palindrome or not. Usepointers.
4. Write a program to sort nnumbers.
5. Program to find biggest, smallest, sum and difference of two numbers using inline function.
6. Program to find the area and volume of respective figures using functionoverloading.
7. Program to add one day to a givendate.
8. Program to add and subtract twomatrices.
9. Program to multiply twomatrices.
10. Program to find the trace and transpose of amatrix.
11. Program to show stackoperations.
12. Create a class time comprises hr,min and sec.as member data and add() and display() as member functions. Use constructor to initialize the object. write a main function to addtwotimeobjects,storeitinanothertimeobjectanddisplaytheresultanttime
13. Program to negate the elements of an array. Use operator overloading function with the operator-.
14. Program to compare two strings. Use operator overloading (==). Do not use any built in functions.
15. Define a class student with name, reg.no, date of birth and name of college as member data and functions to get and display these details. Design another class Test with subjects of study and grade for each subject as member data and corresponding input and output functions. Derive a class Result from both Student and Test classes and Print the Result of each student with relevant information.
16. Start with an array of pointers to strings representing the days of the week. Provide functions to sort the strings into alphabetical order. Usepointers

17. Create a class person with personal details. Define two functions, set details and print details. Declare array of pointers to person class and write a main function to set and print the details of n persons using pointers.

18. Design two classes A and B with member data n1 and n2 respectively. Set values for each one. Write a program to interchange the values of both A and B. Use friend function.

19. Design a class SHAPE with dimensions d1 and d2 as member data and area() as member functions to find the area of a shape. Derive three classes RECT,TRIANG and CIRCL from the class SHAPE and override the function area() of base class to find the area of individual shape. Usevirtual function.

20. Write a program to show returning current object, accessing member data of current object and returning values of object using this pointer.

21. Design a class employee with relevant emp details. Read the details of n emp from the keyboard and write it into a File named empdetails. At the end of writing every n emp details read them back from the same file and display into the screen. Use separate functions to write and read into and out of the file.

22. Addition / Subtraction / Multiplication of complex numbers using classes.

23. Define a class to represent a bank account. Include the following members:Data Members:
    1. Name of the depositor.
    2. Account number.
    3. Type of account.
    4. Balance amount in the account.

    Member Functions

    1. To assign initial values.
    2. To deposit an amount.
    3. To withdraw an amount after checking the balance.
    4. To display name and balance.

24. Assume that a bank maintain two types of accounts for customers, one called as saving account and the other as current account. The saving account provides compound interest and withdrawal facilities, but no check book facility. The current account provides check book facility but no interest. Current account holders should maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class ACCOUNT that stores customer name, account number and type of account. From this derive the classes CURR_ACCT and SAVE_ACCT to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:

    1. Accept deposit from a customer and update the balance.

2. Display the balance.
3. Compute and deposit interest.
4. Permit withdrawal and update balance.
5. Check for the minimum balance, impose penalty if necessary and update the balance.

Note: Do not use constructors. Use member functions to initialize the class members.

25. Create a base class called shape. Use this class to store two double type values thatcould be used to compute the area of figures. Derive two specific classes called TRIANGLE and RECTANGLE from the base SHAPE. Add to the base class, a member function get_data() to initialize base class data members and another member function display_area() to compute and display the area of figures. Make display_area() as a virtualfunctionandredefinethisfunctioninthederivedclasstosuitetherequirements.

GENERAL AWARENESS COURSE II: 3A12BCA DATA STRUCTURES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3A12BCA	4	4	3

COURSE OUTCOME

CO1: Understand theconceptofdatastructuresanditsrelevanceincomputer science.
CO2: Familiarize with selected linear and nonlinear datastructures.
CO3: Enhance skill inprogramming.

Unit I:

Data structures: Definition and Classification. Array: - Operations; Number of elements; Array representation in memory. Polynomial representation with arrays; Polynomial addition. Sparse matrix: Addition of sparse matrices. The concept of recursion. examples – factorial and Tower of Hanoiproblem.

(12 Hrs)

Unit II:

Sorting algorithms: Insertion, bubble, selection, quick and merge sort; Comparison of Sort algorithms. Searching techniques: Linear and Binary search.

(15 Hrs)

Unit III

Stack: Operations on stack; array representation. Application of stack- i. Postfix expression evaluation. ii. Conversion of infix to postfix expression. Queues: Operation on queue. Circular queue; Dequeue, and priority queue. Application of queue: Job scheduling.

(15 Hrs)

Unit IV:

Linked list – Comparison with arrays; representation of linked list in memory. Singly linked list- structure and implementation; Operations – traversing/printing; Add new node; Delete node; Reverse a list; Search and merge two singly linked lists. Stack with singly linked list. Circular linked list – advantage. Queue as Circular linked list. Head nodes in Linked list – Singly linked list with head node – Add / delete nodes; Traversal /

print. Doubly linked list – structure; Operations – Add/delete nodes; Print/traverse. Advantages.

(15 Hrs)

Unit V:

Tree and Binary tree: Basic terminologies and properties; Linked representation of Binary tree; Complete and full binary trees; Binary tree representation with array. Tree traversal: Recursive inorder, preorder and postorder traversals. Binary search tree - Definition and operations (Create a BST, Search, Time complexity of search). Application of binary tree: Huffmanalgorithm.

(15 Hrs)

Books for Study:

1. Debasis Samanta, Classic Data Structures, 2nd Ed, PHI

Books for Reference:

2. G. A. V. Pai, Data Structures and Algorithms: Concepts, Techniques and Applications, 1st Ed, TMH
3. Ellis Horowitz, Sartaj Sahni and Dinesh Mehta, Fundamentals of Data Structures in C++, 2nd Ed, Universities Press

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

GENERAL AWARENESS COURSE III: 3A13BCA DATABASE MANAGEMENT SYSTEM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3A13BCA	4	4	3

COURSE OUTCOME

CO1: Understand the basic concepts inDBMS.
CO2: Skill in designingdatabase.
CO3: Familiarization of different DBMSmodels.
CO4: Skill in writing queries usingMySQL.

Unit I:

Introduction – purpose of Database systems. View of Data, data Models, transaction management, database structure, DBA, Data Base Users.

(12 Hrs)

Unit II:

E-R model, Basic concepts; design issues; Mapping Constraints; Keys; Primary, Foreign, candidate, E-R diagram; Weak entity set; Extended E-R features. Normal forms – 1NF, 2NF, 3NF and BCNF; functional dependency, Normalization.

(15 Hrs)

Unit III:

Relational model – Structure of Relational database. Relational Algebra; Fundamental operations; Relational calculus; Tuple and domaincalculus.

(15 Hrs)

Unit IV:

SQL: database languages; DDL; create, alter, Drop, DML, Insert into, Select, update, Delete, DCL commands, Data types in SQL; Creation of database and user.Case study: MySQL.

(15 Hrs)

Unit V:

Developing queries and subqueries; Join operations; Set operations; Integrity constraints, views, Triggers, functions and Sequences. Case study: MySQL

(15 Hrs)

Books for Study:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts, 6th Ed, TMH
2. Narain Gehani, The Database Book Principles and Practice Using MySQL, University Press

Books for Reference:

1. Elmasri Ramez and Navathe Shamkant, Fundamentals of Database System, 7th Ed, Pearson

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE VI:3B06BCA INTRODUCTION TO MICROPROCESSORS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B06BCA	4	3	3

COURSE OUTCOME

CO1: Familiarize with 8085 architecture.
CO2: Familiarize with 8086 architecture.
CO3: Skill in writing assembly language programs.
CO4: Understand Interrupts and DMA techniques.

Unit I

Introduction: History of Microprocessors, Introduction to 8-bit microprocessor - 8085,Architecture of 8085, Bus organization of 8085, Internal Data Operations and 8085registers.

(15Hrs)

Unit II

Introduction to 16-bit microprocessor – 8086, Architecture of 8086, Functional BlockDiagram, Register Organization of 8086, Signal Description of 8086, Physical MemoryOrganization, Memory Mapped and I/O Mapped Organization, General Bus Operation, I/OAddressing Capability.

(15 Hrs)

Unit III

Addressing Modes of 8086, Machine Language Instruction Format, AssemblyLanguage Programming of 8086, Instruction Set of 8086-Data transfer instructions,Arithmetic and Logic instructions, Branch instructions, Loop instructions, Processor Controlinstructions, Flag Manipulation instructions, Shift and Rotate instructions, Stringinstructions, Assembler Directives and operators.

(15 Hrs)

Unit IV

Introduction to Stack, STACK Structure of 8086, Interrupts and Interrupt ServiceRoutines, Interrupt Cycle of 8086, Non-Maskable and Maskable Interrupts.

(12 Hrs)

Unit V

Data transfer schemes – Programmed IO, Interrupt driven IO and DMA.Programmable Peripheral Interface 8255-features, architecture, DMA Controller 8257-features, architecture, Programmable Interrupt Controller 8259A -features,architecture

(15Hrs)

Books for study

1. K. M. Bhurchandi and A. K. Ray, Advanced Microprocessor and Peripherals, 3rd Ed, TMH
2. Ramesh Gaonkar, Microprocessor Architecture, Programming, and Applications with the 8085, 6th Ed, Penram International Publishing

Books for Reference

1. Douglas V. Hall, Microprocessors and Interfacing: Programming and Hardware, 2ndEd, McGraw Hill

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE VII:3B07BCA JAVA PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B07BCA	4	3	3

COURSE OUTCOME

CO1: Learn the features of java
CO2: Understand the concept of error handling
CO3: Learn about multi - threading
CO4: Experience the GUI Programming.

Unit I

Introduction to Java programming : Java technology; history; java as a new paradigm; features of java; Java Development Kit; Java Language fundamentals; wrapper classes; arrays; strings; StringBuffer classes.

(12 Hrs)

Unit II

Java classes, variables, methods and constructors; Overloading and overriding; Modifiers; Packages; Interfaces.

(15 Hrs)

Unit III

Exception handling: Basics; handling exceptions in java; (Try, catch, finally, multiple catch, nested try, throw); Exception and inheritance; Throwing user defined exceptions; Advantages of exception handling.Multithreading: Overview; Creating threads; thread life cycle; Priorities and scheduling; synchronization; Thread groups; communication of threads; Sample programs.

(15 hrs)

Unit IV

Files and I/O streams: Overview; Java I/O; file streams; FileInputStreamand FileOutputStream; Filter Streams; RandomAccessFile; Serialization; Applets : Introduction; Application vs. applets; Applet lifecycle; Working with Applets; The HTML APPLET tag; the java.applet Package; Sample programs.

(15 Hrs)

Unit V

The Abstract Window Toolkit: - Basic classes in AWT; Drawing with Graphics class; Class hierarchy; Event handling;AWT controls (Labels, Buttons, checkbox, radio buttons; choice control; list, textbox, scroll bars); Layout Managers. The menu component hierarchy; Creating menus; Handling events from menu items.

(15 Hrs)

Books for Study:

1. P. Radha Krishna, Object Oriented Programming Through Java, University Press

Books for Reference:

1. E. Balagurusamy, Programming With JAVA, 5th Ed, TMH
2. Herbert Schildt, Java 2: The Complete Reference, 5th Ed, TMH

Marks including choice:

Unit	Marks
1	14
2	11
3	13
4	11
5	11

GENERAL AWARENESS COURSE IV: 4A14BCA DISCRETE MATHEMATICAL STRUCTURES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4A14BCA	4	4	3

COURSE OUTCOME

CO1: Fundamental mathematical concepts and terminology for Computer Science
CO2: Acquire knowledge in Mathematical Logic
CO3: Gain knowledge in Boolean Algebra and Group Theory
CO4: Awareness about the importance of Graph Theory in Computer Science

Unit I

Sets and Mathematical Logic: Set Theory - Types of sets, Set operations, Principles of Inclusion and Exclusion. Mathematical Logic - Propositional Calculus - Statement, Connectives, Conditional and Biconditional, Equivalence of Formula, Well Formed Formula, Tautologies, Normal Forms, Theory of Inference for the Statement Calculus, Predicate Calculus, Theory of Inference for the Predicate Calculus.

(12 Hrs)

Unit II

Functions and Relations: Functions – Types of Functions, Composition of Functions and Inverse Functions. Relations - Relations and Their Properties, Functions as relations, Closure of Relations, Composition of relations, Equivalence Relations and Partitions. Partial Ordering, Hasse Diagram. The Pigeonhole Principle.

(15 Hrs)

Unit III

Lattices and Boolean Algebra - Lattices and Algebraic Systems, Principles of Duality, Basic Properties of Algebraic Systems Defined by Lattices, Distributive Lattices and Complemented Lattices. Boolean Lattices and Boolean Algebras. Boolean Functions and Boolean Expressions.

(15 Hrs)

Unit IV

Group Theory – Definition and Elementary Properties - Permutation Groups, Cyclic Groups – Subgroups - Cosets,Semigroup and Monoid. Homomorphism and Isomorphism. Rings, Integral Domains and Fields.

(15 Hrs)

Unit V

Graph Theory- Basic concepts- Introduction, Directed Graph, Undirected Graph, Connected and Disconnected Graphs, Bipartite Graph, Complete Bipartite Graph, Isomorphic Graphs, Subgraph. Paths and Circuits. Shortest Paths in Weighted Graphs- Dijkstra's Algorithm. Eulerian Paths and Circuits, Hamiltonian Paths and Circuits. Storage representation and manipulation ofgraphs.Minimum Spanning Trees.

(15 Hrs)

Books for Study:

1. Kenneth H. Rosen and Kamala Krithivasan, Discrete Mathematics And Its Applications with Combinatorics and Graph Theory, 7th Ed, TMH

Books for Reference:

1. J. K. Sharma, Discrete Mathematics, 2004, Macmillan Publishers India Limited
2. Alan Doerr, Kenneth Levasseur, Applied Discrete Structures for Computer Science, Galgotia Publications Pvt Ltd
3. N Ch S N Iyengar, V. M. Chandrasekaran, K. A. Venkatesh and P. S. Arunachalam, Discrete Mathematics, Vikas Publishing
4. C. L. Liu and D. P. Mohapatra, Elements Of Discrete Mathematics (SIE), 4thEd, TMH

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE VIII: 4B08BCA OPERATING SYSTEMS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B08BCA	4	3	3

COURSE OUTCOME

CO1: Understand the basic concepts, structure and functions of operating systems.
CO2: Understand the principles behind the techniques in resource management
CO3: Knowledge about the basic design of the OS

Unit I

OPERATING SYSTEMS OVERVIEW: Operating System Definition, Functions, OS as a resource manager, Types of OS, Evolution of OS, OS Structure, Operating system operations, Process Management, Memory Management, Storage Management, Protection and Security, Operating System Services, User Operating System Interface, System Calls, OS design and implementation, Operating System Structure. (Text 1)

(**14 Hrs)**

Unit II

PROCESS MANAGEMENT:Processes: Process Concept, Process Scheduling, Operations on Processes, Interprocess Communication. CPU Scheduling: Basic concepts, scheduling criteria, Scheduling algorithms. Deadlocks: System Model,Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock. (Text 1)

(**18 Hrs)**

Unit III

MEMORY MANAGEMENT:Memory management: Single contiguous allocation,Partitioned allocation, Relocatable partitioned, Paging, Demand paging, Segmentation, Segmentation and demand paging, Other schemes. (Text 2)

(**14 Hrs)**

Unit IV

STORAGE MANAGEMENT: Mass Storage Structure: Overview, Disk Scheduling: (FCFS, SSTF, SCAN, C-SCAN , Look) , Disk Management. RAID Structure. (Text 1)

(14 Hrs)

Unit V:

File System interface: File Concepts, Directory and Disk Structure.

Protection: Protection: Goals of protection, principles of protection, domain of protection, access matrix. (Text 1)

(12 Hrs)

Books for Study:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 9th Edition, John Wiley and Sons Inc., 2012
2. Stuart E. Madnick and John J Donovan, "Operating Systems", Tata McGraw-Hill, 2005

Books for Reference:

1. Andrew S. Tanenbaum, Herbert Bos, Modern Operating Systems, 4th Ed, Pearson
2. Dhananjay M. Dhamdhere, Operating Systems A Concept Based Approach, 3rd Ed, TMH

Marks including choice:

Unit	Marks
1	13
2	14
3	11
4	11
5	11

CORE COURSE IX: 4B09BCA COMPUTER ORGANIZATION

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B09BCA	4	3	3

COURSE OUTCOME

CO1: Understand the basic operation of a computer system.
CO2: Understand the organization and design of basic digital computer
CO3: Introduce the concepts of microprogramming and design simple combinational digital systems.
CO4: Understand the organization of memory and techniques that computers use to communicate with I/O devices

Unit I

Functional Units and Basic operational Concepts of a digital computer (Textbook 2). Register Transfer and Micro operations: Register Transfer Language-Register Transfer-Bus and memory Transfer. Basic Computer Organization and Design: Instruction Codes – Computer Registers-Computer Instructions-Timing and Control-Instruction cycle-Memory Reference Instructions-I/O and Interrupt-Complete Computer Description-Design of Basic Computer.

(**18 Hrs**)

Unit II

Micro Programmed Control: Control Memory – Address sequencing – Microprogram Example -Design of Control Unit. Central Processing Unit – General Register Organization – Stack Organization - Instruction Formats – Addressing modes – Data Transfer and Manipulations- Program Control – Reduced Instruction set computer(RISC).

(**18 Hrs**)

Unit III

Input Output Organization: Peripheral Devices – Input/output Interfaces – Asynchronous Data Transfer – Modes of transfer –Priority Interrupt – Direct Memory Access (DMA) - Input Output Processor - Serial Communications.

(**12 Hrs**)

Unit IV

Memory Organization: Memory Hierarchy – Main memory – Auxiliary Memory – Associative Memory – Cache memory – Virtual Memory.

(12 Hrs)

Unit V

Pipelining: Parallel processing – Pipelining – Instruction pipeline. Multiprocessors: Characteristics of multiprocessors – Inter connection structures – Inter Processor Arbitration.

(12 Hrs)

Books for Study:

1. M. Morris Mano, Computer System Architecture, 3rd Ed, Pearson
2. Carl Hamacher,Zvonko Vranesic and Safwat Zaky, Computer Organization,5th Ed, TMH

Books for Reference:

1. William Stallings, Computer Organization and Architecture. 10th Ed, Pearson
2. John P. Hayes, Computer Architecture And Organization, 3rd Ed, TMH

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE X: 4B10BCA LINUX ADMINISTRATION

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B10BCA	4	3	3

COURSE OUTCOME

CO1: To learn basic Linux commands and understand the file system structure
CO2: To understand the Boot loaders and the configuration files
CO3: To learn different system services, maintenance and configuring these
CO4: To experience Shell Scripting

Unit I

Linux OS: History, Features and benefits of Linux, basic concepts of multi user system, open source, free Software concepts, Types of users in Linux, Types of files. **BASICS** : login, password, creating an account, shell and commands, logout, changing password, files and directories, relative and absolute pathnames, directory tree, current working directory, referring home directory, creating new directories, copying files, moving files, deleting files and directories , wild cards, hidden files, cat command

(18Hrs)

Unit II

Vi editor: different modes-command mode, insert mode, last line mode, vi Editing commands – moving within a file, deleting, editing,Copy and Paste Commands, Saving and Closing the file, redirecting input/output-filter, pipes. **File permissions:** user, group, ls command (long listing), changing file permission.

(15Hrs)

Unit III

Shell Scripting: Types of shell, Basic shell configuration for bourne and bash shell: /etc/profile, /etc/bashrc, ~/.bash_profile, ~/.bash_login, ~/.profile, ~/.bashrc, ~/.bash_logout, ~/.bash_history. Bourne shell scripts, script execution, variables and parameters, Control structures - Shell if then else, Shell if then elif, Shell for loop, Shell while loop, Shell until loop , Shell case, Shell function.

(15Hrs)

Unit IV

Linux Boot process: LILO - boot process, /edc/lilo.conf file, GRUB - /etc/grub.conf file runlevels, rc files, startup scripts. **Mounting: mounting** file systems, structure of /etc/fstab. **Linux Administration** : Major services in Linux system - init, /etc/inittab file, login from terminal, syslog and its configuration file /etc/syslog.conf, periodic command execution: at and cron, crontab file , GUI, X windows. Starting and stopping different services – service command.

(12Hrs)

Unit V:

System Maintenance: tmpwatch command, logrotate utility. **Backup and Restore**: types of backup - full, differential, incremental, cp, tar commands. **Linux Installation: Partitioning**, MBR, SWAP, file system mount points, rpm utility - installation of packages

(12Hrs)

Books for Study:

1. Yashavant Kanetkar, UNIX Shell Programming, BPB
2. Æleen Frisch, Essential System Administration, 3rd Edition, O'Reilly Media

Books for Reference:

1. Arnold Robbins, Unix in a Nutshell, 4th Edition, O'Reilly Media
2. Evi Nemeth, Garth Snyder and Trent R. Hein, Linux Administration Handbook, 2nd Ed, Prentice Hall
3. Christopher Negus, Red Hat Linux Bible, John Wiley & Sons
4. Rebecca Thomas,Jean Yates, A User Guide to the Unix System, McGraw Hill

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

GENERAL AWARENESS COURSE V: 4A15BCA LAB III: DATA STRUCTURES & DBMS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4A15BCA	III SEM 3 HRS IV SEM 2 HRS	2	3

Sample Program List

Section A: DATA STRUCTURE

1. Add two polynomials.
2. Sequential and binary search : Print number of comparison in each case for given datasets.
3. Insertion sort: number of comparisons and exchanges for given data sets.
4. Bubble sort: Print number of comparisons and exchanges for given data sets.
5. Selection sort: Print number of comparisons and exchanges for given data sets .
6. Quick sort.
7. Stack operation: addition and deletion of elements
8. Queue operation: addition and deletion of elements
9. Conversion of infix expression to postfix.
10. Menu driven program: to add / delete elements to a circular queue. Include necessary error messages.
11. Singly linked list operations : add a new node at the beginning, at the end, after ith node, delete from beginning, end, print the list.
12. Circular linked list : add a new node at the beginning, at the end, after ith node, delete from beginning, end, print the list.
13. Doubly linked list : add a new node at the beginning, at the end, after ith node, delete from beginning, end, print the list.
14. Implement tree traversal.
15. Merge two sorted linked list.

Section B: DBMS

Minimum 10 exercises covering SQL related topics. Sample exercises are given below:

SQL -1

Create table students with fields sno, sname, sex, mark with sno as primary keyand assign suitable constraints for each attribute.Insert five records into the table.

1. Alter the table by adding one more field rank.
2. Display all boy students with their name.

3. Find the Average mark
4. Create a query to display the sno and sname for all students who got More than the
5. average mark. Sorts the results in descending order of mark.
6. Display all girl student names for those who have marks greater than 20 and less than 40.

SQL -2

Create a table department with fields ename, salary, dno, dname, place with dno asprimary key.Insert five records into the table.

1. Rename the field ‘place’ with ‘city’
2. Display the employees who got salary more than Rs.6000 and less than10000 /-
3. Display total salary of the organization
4. Display ename for those who are getting salary in between 5000 and 10000.
5. Create a view named ‘Star’ with field ename, salary & place
6. Display ename and salary with salary rounded with 10 digits’*’

SQL -3

Create a table department with fields dno, dname, dmanager and place with dno asprimary key.

Create a table emp with fields eno, ename, job, dno, salary, with eno as primary key.Set dno as foreign key.

Insert five records into each table.

1. Display the ename and salary, salary with ascending order
2. Display ename and salary for eno=20,
3. Display the manager for the accounting Department
4. Display the name,salary and manager of all employees who are getting salary > 5000
5. Write the queries using various group functions.
6. Write the queries using various Number functions.

SQL -4

Create a table emp with fields eno,ename, job, manager and salary, with eno as primary key. Insert values into the table.

1. Display ename, salary from emp who are getting salary more than average salary of
2. the organization.
3. ADD 20% DA as extra salary to all employees. Label the coloumn as ‘New Salary’
4. Create a query to display the eno and ename for all employees who earn more thanthe average salary. Sort the results in descending order of salary.
5. Create a view called emp_view based on the eno, ename from emp table change theheading for the ename to ‘EMPLOY’.

6. Write a query that will display the eno and ename for all employees whose namecontains a ‘T’.

SQL -5

Create a table department with fields dno, ename, salary, Designation, dname and place with dno as primary key. Insert values into the table.

1. Write the queries using various Character functions in ename field.
2. Create a query to display the employee number and name for all employees who earnmore than the average salary. Sort the results in descending order of salary.
3. Display all employees who got salary between 5000 &10000
4. Display ename, salary, Designation for those who got salary more than 5000 or hisDesignation is ‘clerk’.
5. Display ename and designation those who are not a clerk or manager.
6. Display the names of all employees where the third letter of their name is an ‘A’

SQL -6

Create a table Customer with fields cid, cname, date_of_birth and place
Create table loan with fields loanno, cid and bname assigning suitable constraints.
Create table depositor with fields accno, cid, balance and bname assigning suitable constraints.
Insert 5 Records into each table.

1. Add one more field amount to loan table. Update each record. Display cname forcid=2.
2. Calculate Rs 150 extra for all customers having loan.The added loan amount will
3. display in a new coloumn.
4. Display loanno, cname and place of a customer who is residing in Kannur city.
5. Display all information from loan table for loanno 2,8,10.
6. Display all customers who have both loan and deposit.

CORE COURSE XI: 4B11BCA LAB IV: JAVA PROGRAMMING, SHELL PROGRAMMING & LINUX ADMINISTRATION

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B11BCA	III SEM 2 HRS IV SEM 3 HRS	2	3

Sample Program List

SECTION A: JAVA PROGRAMMING

1. Write a java program to perform various string operations using java class.
2. Write java program to implement interface.
3. Write java program that handles various exceptions. Use try –catch statement.
4. Write java program to implement file I/O operation using java iostreams.
5. Write java program to implement Applet life cycle.
6. Write java program to implement a calculator using suitable AWT controls.
7. Write java program to implement packages.
8. With API suport write demo programs for menu display
9. Write a java program to demonstrate threads.
10. Demonstration of FileInput Stream and FileOutputStream Classes

SECTION B: SHELL PROGRAMS

1. Get a name and number from the user, create a file with that name and number. Also display the contents of the file.
    - If the name is XXX and number is 2 the filename must be XXX_2
    - use cat command to create a file
    - Create the file with 10 different lines, then display the first 5 lines of file using head command.
2. Write a program to greet a user by 'Good Morning', Good Afternoon' or 'Good Evening' based on time
    - get the system time using 'date' command

- Read the name from the user
    - if the name is 'XXX' then greet with 'Hello XXX, Good Morning! '

3. Write a shell program to check whether a number is positive,negative or zero
4. Shell Script To Print A Number In Reverse Order
5. Write a program to check whether a user has logged in or not. The username is passed as command line argument
6. Write a demo program for the number and string comparison operators
    - verfiy whether the entered username and password is of admin user's if so display a warning message 'Permission denied'
    - read a number from the user. Check whether number of files in a folder is greater than the read number
7. Write a demo program using basic calculator
    - find the average size of the files available in a folder
8. A program to create 10 users
    - use loop structure
    - get the usernames from the user
    - assign same password to all the users
9. A demo program to test different file operators
    - read filename from the user
        - Check if the file exists, if exists then display the contents, otherwise create the file
        - Check whether the size of the file is zero
        - check whether the file is having read, write and execute permission
10. Write a program with 3 different functions. Use Menu driven program and invoke the function accrodingly
    - Function for listing the contents of a folder
    - Function for checking whether a file is available in a folder or not if so display the contents
    - Function to check whether an user is already a member of a group

LINUX ADMINISTRATION

1. Linux installation, upgradation and rescue.
2. Boot loader configuration using GRUB
3. Managing the run level.
4. Starting and stopping services in runlevel.
5. The service command
6. Managing process- viewing status, killing, restarting etc using ps.
7. Adding and deleting user accounts, changing passwords.
8. Changing the environment variables like PATH
9. Scheduling jobs using cron
10. Managing kernel modules
11. Mounting and unmounting external file systems
12. Setting the value of umask, changing the permissions, changing owner and groups
13. Installation and removal of packages
14. Installation of a peripheral devices (eg printer)
15. Archiving and Backup using tar. Restoring backup
16. Compressing and uncompressing files using any one tool

CORE COURSE XII: 5B12BCA SOFTWARE ENGINEERING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B12BCA	3	3	3

COURSE OUTCOME

CO1: Understand the basic processes in software Development lifecycle.
CO2: Familiarize with different models and theirsignificance.
CO3: Familiarize with requirement engineering and classical software designtechniques.
CO4: Familiarize with various software testing techniques andtools.

Unit I

Introduction to software engineering-Definition, program versus software, software process, software characteristics, brief introduction about product and process, software process and product matrices; Software life cycle models – Definition, waterfall model, increment process model, evolutionary process model, selection of the life cycle model.

(10Hrs)

Unit II

Software Requirement Analysis and Specification – Requirements engineering, types of requirements, feasibility studies, requirement elicitation, various steps of requirement analysis, requirement documentation, requirementvalidation.

(10Hrs)

Unit III

Software design – definition, various types, objectives and importance of design phase, modularity, strategy of design, function-oriented design, IEEE recommended practice for software designdescriptions.

(12Hrs)

Unit IV

Objected Oriented Design – Analysis, design concept, design notations and specifications, design methodology.

(8Hrs)

Unit V

Software Testing – What is testing, Why should we test, who should do testing? Test case and Test suit, verification and validation, alpha beta and acceptance testing, functional testing , techniques to design test cases , Boundary value analysis, equivalence class testing, decision table based testing; structural testing , path testing , Graph matrices , Data flow testing , levels of testing ,unit testing , integration testing, system testing , validationtesting

(14Hrs)

Books for Study:

1. K. K. Aggarwal, Yogesh Singh, Software Engineering, 3rd Ed, New Age International Publication (For unit 1,2,3,5 and case study of unit4)
2. Pankaj Jalote, An Integrated Approach toSoftwareEngineering, 2nd Ed, Narosa Publishing House (For Unit 4)

Books for Reference:

1. Ian Sommerville, Software Engineering, 10th Ed, Pearson
2. Roger S Pressman, Software Engineering: A Practitioner's Approach, 6th Ed, TMH
3. Carlo Ghezzi, Mehdi Jazayeri and Dino Mandrioli, Fundamentals of Software Engineering, 2nd Ed, Pearson

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORECOURSE XIII: 5B13BCA ENTERPRISE JAVA PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B13BCA	4	4	3

COURSE OUTCOME

CO1: Understand the Enterprise Java platform
CO2: Learn APIs and runtime environment for developing and running large scale Projects.
CO3: Develops programming skills in multi – tiered, scalable, reliable and secure Network application.
CO4: Understand the structure of a web application.

Unit I

Java Database Connectivity: JDBC architecture; Drivers, JDBC-ODBC bridge, native API partly java driver, Net Protocol all Java driver, Native protocol all Java driver; Connecting to Database; statements; Large data types; Dates and Times; Handling Errors; SQL warning; Metadata, database meta data, result set meta data

(15 Hrs)

Unit II

Remote Method Invocation: RMI architecture; RMI Object services; Naming/registry service, object activation service, distributed garbage collection; Defining Remote objects; Key RMI classes for remote object implementations; Stubs and skeletons; Accessing remote object as a client; Remote method arguments and return values; Dynamically loaded classes; Configuring clients and servers for remote class loading;

(15 Hrs)

Unit III

Java Servlets: Life cycle; HTTP Servlets, forms **and** interaction; **POST,** HEAD and other requests; Servlet requests; Servlet responses; Error handling, status codes; Custom Servlet Initialization; Thread safety; Cookies; Session tracking

(15 Hrs)

Unit IV

Common Object Request Broker Architecture: Introduction to CORBA, CORBA architecture, CORBA versus Java RMI, IDL Compiler, Interface definition language, IDL stub, IDL Skelton interface, Object Request Broker; Naming service; Inter-ORB communication.

(12 Hrs)

Unit V

Creating CORBA objects; Creating IDL modules, interfaces, data members and methods; IDL and Java; Simple server class, helper class, holder class, client stubs and server skeltons; Writing the implementation class; Initializing ORB, Registering with a naming service; Adding objects to a naming context; Finding remote objects; Initial ORB references; Getting objects from other Remote objects.

(15 Hrs)

Books for Study:

1. Java Enterprise in a Nutshell by David Flanagan and Jim Parley, O'Reilly Associates Inc.

Books for Reference:

1. David Flanagan, Jim Farley and and William Crawford, Java Enterprise in a Nutshell, 2nd Edition, O'Reilly Media
2. Jim Keogh, J2EE: The Complete Reference, 1st Ed, TMH
3. C. Nellai Kannan, Java & J2EE, Nels Publication
4. Thomas J. Mowbray and William A. Ruh, Inside CORBA: Distributed Object Standards and Applications, Addison Wesley

Marks including choice:

Unit	Marks
1	14
2	13
3	13
4	10
5	10

CORE COURSE XIV:5B14BCA PYTHON PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B14BCA	2	2	3

COURSE OUTCOME

CO1: Learn Python for expressing computation
CO2: Familiarize with functions and modules in python
CO3: Understand object-oriented programming concepts in Python
CO4: Learn the techniques for database connectivity and GUI programming in Python

Unit I

Basic Elements and Control Statements: Features of Python, Different Methods to Run Python, Basic Elements (Objects, Expressions, Numerical Types, Strings, Variables), Comments, Indentation in Python, Input and Output in Python, import function, Operators in Python, Branching (if, else, elif), Iteration (while, for), range and enumerate functions, Tuples, Lists, Sets, Dictionaries, Built-in methods of lists, sets and dictionaries, Mutable and Immutable Objects.

(8 Hrs)

Unit II

Functions, Modules and Exception Handling: Functions Definition, Function Calling, Function Arguments (Required, Keyword, Default), Recursion, Modules, Built-in Modules, Creating Modules, File Handling (Opening, Closing, Writing, Reading), Exceptions, Built-in Exceptions (IndexError, OverflowError, ZeroDivisionError, RuntimeError), Exception Handling.

(8 Hrs)

Unit III

Object Oriented Programming, Arrays and Data Visualization: Class Definition, Object Creation, Built-in Attribute Methods, Object Oriented Programming Features of Python. Arrays in Python, Numpy Module, ndarray, Creating Arrays (array, zeros, ones, empty, linspace, arrange, random), Two-Dimensional Array, Indexing, Slicing, Iterating, Copying, Splitting, Shape Manipulation (reshape, transpose, resize), Arithmetic Operations on Arrays. Data Visualization in Python matplotlib Module, pyplot, plot(), scatter, bar charts, Formatting, figure(), subplot(), text(), xlabel(), ylabel(), title(), Plotting Simple Mathematical Functions (sin x, x^2).

(8 Hrs)

Unit IV

Connecting to Database: Connecting to a Database, Basic Operations on Database (Crater, Insert, Update, Delete), Fetching Data from a Database, Transaction Control.

(6 Hrs)

Unit V

GUI Programming: GUI Programming using Tkinter, Tkinter Widgets (Label, Message, Entry, Text, Button, tkMessagebox, RadioButton, Checkbutton, Listbox, Menu, Menubutton, Scale, Scrollbar, Canvas), Layout Managers.

(6 Hrs)

Books for Study:

1. Dr. Jeeva Jose, Taming Python By Programming, Khanna Publishing
2. John V. Guttag, Introduction to Computation and Programming Using Python with Application to Understanding Data, PHI (2016)
3. https://www.numpy.org/devdocs/user/quickstart.html
4. https://matplotlib.org/users/pyplot_tutorial.html

Books for Reference:

1. Charles Dierbach, Introduction to Computer Science using Python, Wiley (2015)
2. https://www.tutorialspoint.com/python/
3. Python for Education by Ajith Kumar B P
4. https://docs.python.org/3/tutorial/index.html
5. Introduction to Computer Science and Programming Using Python Provided by Massachusetts Institute of Technology (MITx) - Available at : (https://www.edx.org/course/introduction-to-computer-science-and-programming-using-python-2)

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE XV:5B15BCA WEB TECHNOLOGY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B15BCA	2	2	3

COURSE OUTCOME

CO1: Enable students to program for the World Wide Web using HTML, JavaScript, PHP and MySQL.
CO2: Create static and dynamic web pages PHP and MySQL.
CO3: Impart basic knowledge in relational databases, SQL and, Client-server model.

Unit I

Introduction to internet and web, An overview of internet programming –WWW design issues. Introduction to HTML-structure of HTML, tags, attributes, syntax of tags, starting and ending tags, html doc elements-<html>, <title>,<body>,physical style tags, listing, labeling, grouping, <img>-<a>

(8 Hrs)

Unit II

Table tags-<tr>,<td>,<th> attributes-height, width, rowspan, colspan, border, color. Form-tag attributes-type-passwd, submit, radio, check, method, action. Frame-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes.

(6 Hrs)

Unit III

Javascript-datatypes, variables, function, object, array.Client-side object hierarchy and document. object Model, <script>, event handlers, javaScript in urls. Windows and frames dialog boxes, status line, navigator object, opening Windows, closing windows, Location object, history object. - Date object- math object- Accessing form object**.**

(11 Hrs)

Unit IV

Introduction to PHP, advantages of PHP, PHP basics- operators and Flow Control, strings and arrays, creating functions**.**

(7 Hrs)

Unit V

Objects, Web Techniques, HTTP Basics, Databases, Using PHP to access database, Client-server model.

(4 Hrs)

Books for Study:

1. Bill Kennedy, Chuck Musciano, HTML: The Definitive Guide, 3rd Ed, O'Reilly Media
2. Flanagan David, JavaScript: The Definitive Guide, 6th Ed, O'Reilly Media
3. Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre, Programming PHP, 3rd Ed, O'Reilly Media

Books for Reference:

1. Steven Holzner, PHP: The Complete Reference, 1st Ed, TMH
2. Dave W. Mercer, Allan Kent, Steven D. Nowicki, David Mercer, Dan Squier, Wankyu Choi, Heow Eide-Goodman, Ed Lecky-Thompson, Clark Morgan, Beginning PHP5, Wrox
3. Thomas A. Powel, HTML & CSS: The Complete Reference, 5th Ed, TMH

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE XVI: 5B16BCA-E01 INFORMATION SECURITY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B16BCA-E01	4	3	3

COURSE OUTCOME

CO1: To understand the need of information security and to master information security Concepts, mechanisms and services as well as issues related to information Security.
CO2: To be familiar with cryptography and its categories.
CO3: Distinguish public and private key crypto systems and familiarize the rsa crypto System.
CO4: To attain the knowledge of digital signature and its security services.

Unit I

Introduction to Information Security- The need for Security, Principles of security - confidentiality, Authentications, Integrity, Non-repudiation. Types of attacks- Passive attacks, Active attacks, Virus, Worm, Trojan horse. Introduction to Cryptography, Steganography, Secret Sharing.

(14 Hrs)

Unit II

Traditional symmetric Key Ciphers: Introduction-Kirchhoff's principle, cryptanalysis, categories of traditional ciphers; Substitution Ciphers – mono alphabetic ciphers, polyalphabetic ciphers; Transposition Ciphers - keyless and keyed transposition ciphers, Stream and Black Ciphers - stream ciphers, block ciphers.

(16 Hrs)

Unit III

Introduction, DES Structure - initial and final permutations, rounds, cipher and reverse cipher, examples; DES Analysis - properties, design criteria, DES weaknesses; Multiple DES - double DES, triple DES; Security of DES - brute-force attack, differential cryptanalysis, linear cryptanalysis.

(16 Hrs)

Unit IV

Principles of Public Key Cryptosystems- Public Key Cryptosystem, Applications of Key Cryptosystems, Requirement for Public Key Cryptosystem, Public Key Cryptanalysis.

RSA Algorithm–Description of the Algorithm, Computational Aspects, Security of RSA.

(13 Hrs)

Unit V

Comparison- inclusion, verification method, relationship, duplicity; Process- needs for keys, signing the digest; Service- message authentication, message integrity, nonrepudiation, confidentiality; Attacks on Digital Signature- attack types; Digital Signature Schemes- RSA digital signature schemes

(13 Hrs)

Books for Study:

1. Behrouz A. Forouzan and Debdeep Mukhopadhyay, Cryptography And Network Security, 3rd Ed, Mc Graw Hill (Units I, II, III, V)
2. William Stallings, Cryptography and Network Security - Principles and Practice Paperback, 7th Ed, Pearson(Unit IV)

Books for Reference:

1. Pieprzyk Josef, Hardjono Thomas and Seberry Jennifer, Fundamentals of Computer Security, Springer, 2003.

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE XVI: 5B16BCA-E02 MOBILE COMMUNICATIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B16BCA-E02	4	3	3

COURSE OUTCOME

CO1: Understand GSM, CDMA concepts and architecture, frame structure, system capacity, services provided.
CO2: Understand about Wireless LAN
CO3: Understand about Mobile IP

Unit I

Introduction – history of wireless communication, A simplified reference model, frequencies for radio transmission, signals, Antennas, signal Propagation, Spread spectrum – DSSS and FHSS, Cellular systems.

(16 Hrs)

Unit II

SDMA, FDMA, TDMA and CDMA, GSM – Mobile services, system Architecture, Radio interface, Protocols, Localization and Calling, Handover, Security,GPRS.

(14 Hrs)

Unit III

Wireless LAN – infrared versus Radio transmission, IEEE 802.11 – system Architecture, Protocol architecture, Physical Layer, MAC Layer, MAC Management, 802.11b, 802.11a. Introduction to Bluetooth – IEEE802.15.

(14 Hrs)

Unit IV

Mobile IP – entities and Terminology, IP Packet delivery, Agent discovery, registration, tunneling, IPV6, Introduction to MANET, TCPover2.5/3G Wireless Networks.

(14 Hrs)

Unit V

WAP (1.x) – Architecture, Wireless Datagram Protocol, Wireless Transport Layer security. Wireless Transaction Protocol, wireless Session Protocol, wireless Application

Environment, wireless Markup Language, WML script, Introduction to WAP 2.0.

(14 Hrs)

Books for Study:

1. Jochen Schiller, Mobile Communications, 2nd Ed, Pearson

Books for Reference:

1. Roy Blake, Leo Chartrand, Wireless Communication Technology, 1st Ed, Delmar Cengage Learning
2. William C. Y. Lee, Mobile Communications Engineering: Theory and Applications, 2nd Ed, Mc Graw Hill
3. Kamilo Feher, Wireless Digital Communications: Modulation and Spread Spectrum Applications, Prentice Hall;
4. Vijay K. Garg and Jospeh E. Wilkes, Principles and Applications of GSM, Pearson

Marks including choice:

Unit	**Marks**
1	12
2	12
3	12
4	12
5	12

CORE COURSE XVI: 5B16BCA-E03 C# AND .NET PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B16BCA-E03	4	3	3

COURSE OUTCOME

CO1: To expose students to current trends and styles in programming
CO2: To familiarize simple, modern, general-purpose, object-oriented programming language.

Unit I

Introduction to C# **-** Evolution, Characteristics, applications. Understanding .NET- Origin of .NET Technology, .NET Framework, Common Language Runtime (CLR), .NET Approach. Overview of C#- Program Structure, A Simple C# Program, Namespaces, Command Line Argument, Errors.

(16 Hrs)

Unit II:

Basic concepts of Programming: Literals, Variables, Boxing and Unboxing, Data types, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

(16 Hrs)

Unit III:

Object Oriented aspects of C#, Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions, Multithreading.

(16 Hrs)

Unit IV:

Application Development on .NET Web Applications – Web form Fundamentals, Web form Events, Webform Life cycle, Creating a Web Application, Web Services. Windows Applications – Creating a Windows Application.

(14 Hrs)

Unit V:

Database Access and .NET Components Accessing Data with ADO.NET Assemblies, Versioning, Attributes, Reflection, Viewing Meta Data, Type Discovery, Reflecting on a type, Marshalling, Remoting.

(10 Hrs)

Books for Study:

1. E. Balagurusamy, Programming in C#, 4th Ed, Mc Graw Hill
2. Jesse Liberty, Programming C#, 2nd Ed, O'Reilly Media

Books for Reference:

1. Jeff Ferguson, Brian Patterson, Jason Beres, Pierre Boutquin and Meeta Gupta, C# Bible, John Wiley & Sons
2. Jeff Prosise, Programming Microsoft .NET, Microsoft Press US
3. Kevin Hoffman, Jeffrey Hasan, Thiru Thangarathinam, Denise Gosnell, Jan Narkiewicz, Jeff Gabriel, John Schenken, Christian Holm, Scott Wylie, Jonothon Ortiz, Ed Musters and Professional .NET Framework, Wrox

Marks including choice:

Unit	Marks
1	15
2	15
3	15
4	10
5	5

CORE COURSE XVI: 5B16BCA-E04 BIOINFORMATICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B16BCA-E04	4	3	3

COURSE OUTCOME

CO1: Understand Bioinformatics and biological databases.

CO2: Understand Concept of Biology

CO3: Understand Sequence alignment and Similarity search tools.

CO4: Structural bioinformatics and Bioinformatic tools

Unit I

INTRODUCTION & BIOLOGICAL DATABASES: Introduction to bioinformatics, Goal, Scope, Applications and Limitations; Introduction to Biological databases – databases and types of databases, biological databases – primary, secondary and specialized; Information retrieval from biological databases

(16 Hrs)

Unit II

CELL BIOLOGY AND GENETICS: Prokaryotes and Eukaryotes, Introduction to cell structure –Plant and animal cell, Introduction to DNA – Chemical nature of DNA, Central dogma of molecular biology

(20 Hrs)

Unit III

SEQUENCE ALIGNMENT: Pairwise sequence alignment – Global and local, Alignment algorithms – Dot matrix method, Dynamic programming method, Scoring matrices – PAM, BLOSUM, Statistical significance of Sequence alignment; Database Similarity Searching – BLAST, FASTA, Comparison of BLAST and FASTA, Statistical significance

(20 Hrs)

Unit IV

STRUCTURAL BIOINFORMATICS & BIOINFORMATIC TOOLS: Structure of protein – Amino acids, peptide formation, Structural forms of protein**;** Protein structure visualization – SwissPDB viewer, Pymol, Rasmol; Bioinformatic tools (EMBOSS package, Expasy)

(16 Hrs)

Books for Study:

1. Jin Xiong, Essential Bioinformatics Paperback, Cambridge University Press
2. Paul G. Higgs and Teresa K. Attwood, Bioinformatics and Molecular Evolution, Blackwell Publishing Ltd

Books for Reference:

1. P. S. Verma and V. K. Agarwal, Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S.Chand
2. Andreas D. Baxevanis and B. F. Francis Ouellette, Bioinformatics: A Practical Guide To The Analysis Of Genes And Proteins

Marks including choice:

Unit	Marks
I	12
II	18
III	18
IV	12

CORE COURSE XVII: 6B17BCA DESIGN AND ANALYSIS OF ALGORITHM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B17BCA	4	4	3

COURSE OUTCOME

CO1: Knowledge about important computational problems.
CO2: Knowledge to design the algorithm.
CO3: Knowledge to analyze a given algorithm.
CO4: Acquire knowledge to analyzealgorithm control structures and solving recurrences.

Unit I:

Algorithm Design: Introduction, Steps in developing algorithm, Methods of specifying an algorithm, Decisions prior to designing based on the capabilities of the device, based on the nature of solutions, based on the most suitable data structures. Model of Computation: RAM model and PRAM model.

(10 Hrs)

Unit II:

Important Problem Types: Sorting, Searching, String matching, Graph problems, Combinatorial problems, Geometric problems, Numerical problems. Basic Technique for Design of Efficient Algorithm: Brute Force approach, Divide-and-Conquer approach, Greedy approach, Dynamic Programming, Backtracking, Branch-and-Bound technique.

(20 Hrs)

Unit III:

Algorithm Analysis: Importance of algorithm analysis, Time and Space Complexity. Growth of Functions: Asymptotic notations, Cost estimation based on key operations- big Oh, big Omega, little Oh, little Omega and Theta notations.

(8 Hrs)

Unit IV:

Analysing Algorithm Control Structures, Solving Recurrences: Substitution Method, Iteration Method, The Recursion Tree Method, Master’s Theorem. Problem Solving using Master’s Theorem Case 1, Case 2 and Case 3. Best case, worst case and average case performance analysis.

(20 Hrs)

Unit V:

Study of the structure of algorithms: Strasser's algorithm, Huffman coding, Kruskal's algorithm and Prim's algorithm.

(14 Hrs)

Books for Study:

1. Pallaw, V K, Design and Analysis of Algorithms, Asian Books Private Ltd, 2012, ISBN: 8184121687.
2. Pandey H M, Design and Analysis of Algorithms, University Science Press, 2013, ISBN: 9788131803349.

Books for Reference:

1. Upadhyay N, Design and Analysis of Algorithms, SK Kataria & Sons, 2008.
2. U. Manber, Introduction to Algorithms: A Creative Approach, Addison Wesley, ISBN: 9780201003277.
3. Gilles Brassard and Paul Bratley, Fundamentals of Algorithmics, Prentice-Hall of India, ISBN: 0133350681.
4. Goodman S E and Hedetniemi, Introduction to the Design and Analysis of Algorithms, Mcgraw Hill, ISBN: 0070237530.
5. Horowitz E and Sahni S, Fundamentals of Computer Algorithms, Galgotia Publications Pvt. Ltd, ISBN: 8175152575.

Marks including choice:

Unit	Marks
1	8
2	13
3	13
4	13
5	13

CORE COURSE XVII: 6B18BCA INTRODUCTION TO COMPILER

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B18BCA	4	3	3

COURSE OUTCOME

CO1: Knowledge about Compiler
CO2: Knowledge about various phases of compiler design.

Unit I:

Introduction to compiling - definition of compiler, Classification of Compiler: Single pass, Multi pass, Load and Go. Parts of Compilation: Analysis and Synthesis. The phases of a compiler: Lexical Analyser, Syntax Analyser, Semantic Analyser, Intermediate code generator, Code optimizer, Target Program, Symbol table manager.

(15 Hrs)

Unit II:

Programming language basics - lexical analysis – role of lexical analyzer – input buffering - specification of tokens – recognition of tokens using finite automata.

(15 Hrs)

Unit III:

Syntax analysis – role of parser – error handling and recovery – definitions of parsing, top-down parsing and bottom-up parsing - context free grammars – derivations - parse tree – ambiguity – associativity and precedence of operators - writing a grammar.

(12 Hrs)

Unit IV:

Intermediate code generation – DAG – three address code – addresses and instructions – quadruples – triples – Static Simple Assignment form – types and declarations – type expressions - type equivalences – declarations – type checking – rules – type conversion.

(15 Hrs)

Unit V:

Run time environments – storage optimization – static Vs dynamic allocation – stack allocation of space - activation trees and records – calling sequences. Code generation – issues in the design of a code generator – the target language – a simple target machine model. Code optimization - the principal sources of optimization – data flow analysis – abstraction – data flow analysis schema – data flow schemas on basic blocks.

(15 Hrs)

Books for Study:

1. V Aho A, Ravi Sethi, D Ullman J, Compilers Principles, Techniques and Tools, 2nd Edition, Pearson Education Singapore Pte Ltd, ISBN: 8131721019.

Books for Reference:

1. Principles of Compiler Design by MG Durga and TG Manikumar. ISBN: 978-81-8094-161-0
2. W Appel and Andrew, Modern Compiler Implementation in C, 1st Edition, Cambridge University Press, ISBN: 817596071X.
3. Allen I Holub, Compiler Design in C, 1st Edition, PHI Learning Pvt Ltd, ISBN: 812030778X.

Marks including choice:

Unit	**Marks**
1	12
2	12
3	12
4	12
5	12

CORE COURSE XIX: DATA COMMUNICATION & NETWORKS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B19BCA	3	3	3

COURSE OUTCOME

CO1: Understand the basics of datacommunication
CO2: Familiarize with OSI referencemodel
CO3: Familiarize students with layers of communicationmodel
CO4: Understand the concepts of networksecurity

Unit I

Introduction to data communication, important elements /components of data communication, Data transmission- Analog, Digital. Transmission media- Guided media, Unguided media. Synchronous / Asynchronous data transmission. Line configuration – Simplex, Half duplex, Duplex. Network topologies – star, Bus, ring, Mesh. Computer networks, Use, network hardware, network structure- point to point connection, multicast, broadcast, classification of networks-LAN, WAN, Man. Network software – protocol hierarchies. design issues for layers, interfaces and services- connection oriented, connection less.

(12 Hrs)

Unit II:

Reference models, the OSI reference model, TCP / IP reference model. Comparison between OSI and TCP / IP models.Data Link Layer, Design issues, Services to network layer, Framing- character count, character stuffing, bit stuffing, physical layer coding violation. Error control, flow control, Elementary data link protocols- unrestricted simplexprotocol,simplexstopandwaitprotocol,simplexprotocolforanoisychannel.

(12 Hrs)

Unit III:

Network layer, design issues, services to the transport layer, routing algorithms- adaptive, non-adaptive algorithms, optimality principle, dijkstras shortest path routing algorithm, flow based routing, hierarchical routing, congestion control algorithms – the leaky bucket algorithm, the token bucketalgorithm.

(10 Hrs)

Unit IV

Transport layer, design issues, connection management-addressing, establishing and releasing connection, transport layer protocols- TCP,UDP

(10 Hrs)

Unit V

Application layer, network security, traditional cryptography, substitution ciphers, transposition ciphers, fundamental principles, secret key algorithm, dataencryption standard, DES chaining, DES breaking. Public key algorithm, RSAalgorithm.

(10 Hrs)

Books for Study:

1. Computer Networks, Andrew S. Tanenbaum & David J. Wetherall, Pearson.

Books for Reference:

1. Data Communication and Networking, Behrouz A. Forouzan, McGraw Hill Education.
2. Achyut S. Godbole and Atul Kahate, Data communication and Networks, 2nd Ed, Mc Graw Hill
3. Computer Networking: A Top-Down Approach, Kurose James F. and Ross Keith W., Pearson.
4. R. S. Rajesh, K. S. Easwara Kumar and R. Balasubramanian, Computer Networks – Fundamentals and Applications, Vikas Publishing House.

Marks including choice:

Unit	**Marks**
1	12
2	12
3	12
4	12
5	12

CORE COURSE XX: 6B20BCA-E01DATA MINING AND DATA WAREHOUSING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B20BCA-E01	3	3	3

COURSE OUTCOME

CO1: Understanding the importance of dataminingand data ware housing.
CO2: Understand the data management aspects data preprocessing model andinference considerations, complexity considerations, post processing of discovered structures visualization and onlineupdating

Unit I

Introduction; data warehousing – what is, Multidimensional data model, OLAP operations, warehouse schema, Data warehousing Architecture, warehouse server, Metadata, OLAP engine, data warehouse Backend Process.

(12 Hrs)

Unit II

Data mining – what is, KDD vs data mining, DBMS vs data mining, DM Techniques, issues and challenges, Applications. (Case studies) *

(8 Hrs)

Unit III

Association rules – What is, Methods, a priori algorithm, partition algorithm, Pincer-search algorithm, FP-tree growth algorithm, incremental and Border algorithms, Generalized Associationrule.

(12 Hrs)

Unit IV

Clustering techniques – Paradigms, Partitioning Algorithms, k – Medoid algorithms, CLARA, CLARANS, hierarchical clustering, DBSCAN, Categorical Clustering, STIRR.

(10 Hrs)

Unit V

Decision trees – what is, tree construction principles, Best split, Splitting indices, Splitting criteria, decision tree construction algorithms, CART, ID3, C4.5, CHAID. Introduction to web, spatial and temporal datamining.

(12 Hrs)

Books for Study:

1. Arun K. Pujari, Data Mining Techniques, 2nd Ed, Univeristy Press

Books for Reference:

1. Jiawei Han, Micheline Kamber and Jian Pei, Data Mining: Concepts and Techniques, 3rd Ed, Morgan Kaufmann
2. Margaret H. Dunham, Data Mining - Introductory and Advanced Topics, Pearson

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE XX: 6B20BCA-E02 NETWORK PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B20BCA-E02	3	3	3

COURSE OUTCOME

CO1: Understand basics of network programming
CO2: Understand basics of socket options
CO3: Familiarize with DNS

Unit I

Introduction –A Simple Day Time Client – Protocol Independence – ErrorHandlingA Simple - Day Time Server.The Transport Layer: TCP, UDP – TCP Connection EstablishmentandTermination–TIME_WAITState–PortNumbers– ConcurrentServersBuffer Size and Limitations – Standard Internet Services – Protocol Usage by Common InternetApplications.

(15 Hrs)

Unit II

Socket Introduction – Socket address Structures – Byte Ordering Functions – Byte Manipulation Functions – Elementary TCP Sockets – socket , connect, bind, listen, accept, fork and exec, close, getsockname and getpeername functions.

(15 Hrs)

Unit III

TCP Client/Server Example – TCP Echo Server - main(), str_echo() – TCP Echo Client - main(), str_cli() – startup – termination – Shutdown of ServerHost.

(7 Hrs)

Unit IV

Socket Options – getsockopt and setsockopt functions – Socket States –Generic Socket Options – TCP Socket Options.

(7 Hrs)

Unit V

Name and Address Conversions - DNS – gethostbyname – gethostbyaddr –

getservbyname – getservbyport – getaddrinfo – freeaddrinfo – host_serv – tcp_connect – tcp_listen functions.

(10 Hrs)

Books for Study:

1. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, "Unix NetworkProgramming The Sockets Networking API Volume I", Pearson

Books for Reference:

1. Barry Nance, "Network Programming in C", Prentice Hall

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE XX: 6B20BCA-E03DIGITAL IMAGE PROCESSING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B20BCA-E03	3	3	3

COURSE OUTCOME

CO1: Understand geometric transformations
CO2: Understand basic of morphological image processing

Unit I:

Images – DIP components – Problems and Applications – motivation and perceptive – Operations – Imaging – electronic camera – Human Eye – 3D imaging – Depth from triangulation , time-of-flight, interferometry, shading, tomography, Sampling – quantization, Color Image representation, Volumetricdata.

(12 Hrs)

Unit II:

Images in Java – java2D API – java advanced imaging – image manipulation – storage – reading and writing images – display – printing – pixel processing – gray level andcolor enhancement – mapping – image histogram – Histogram equalization – Colour processing.

(12 Hrs)

Unit III:

Neighborhood operations – convolutions and correlation – Linear and rank filteringEdge detection – Hybrid adaptive filters – frequency domain – spatial frequency –Fourier theory – DFT – investigating spectra – image filtering –deconvolution.

(12 Hrs)

Unit IV:

Geometric operation – simple techniques – Affine transformations – Algorithm – interpolation schemes – Wrapping and morphing – segmentation – thresholding – Contextual techniques.

(12 Hrs)

Unit V:

Morphological image processing – Basic concepts – operations – Morphological filtering – Morphological algorithms – Gray scale morphology – image compression. Redundancy – Performance characterization – Lossy and lossless compression techniques – compression of movingimages.

(6 Hrs)

Books for Study:

1. Nick Efford , Digital Image Processing: A Practical Introduction using Java, Addison Wesley

Books for Reference:

1. Rafael C. Gonzalez and Richard E. Woods, Digital Image Processing, 4th Ed, Pearson
2. Jähne, Bernd, Digital Image Processing, Springer

Marks including choice:

Unit	**Marks**
1	12
2	12
3	12
4	12
5	12

CORE COURSE XX: 6B20BCA-E04CLOUD COMPUTING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B20BCA-E04	3	3	3

COURSE OUTCOME

CO1: Understand fundamentals of cloud computing
CO2: Understand principles of parallel and distributed computing
CO3: Familiarize with Cloud Computing Architecture

Unit I

Introduction: Cloud Computing at a Glance - Historical Developments - Building Cloud Computing Environments - Computing Platforms and Technologies

(8Hrs)

Unit II

Principles of Parallel and Distributed Computing: Eras of Computing - Parallel vs. Distributed Computing - Elements of Parallel Computing - Elements of Distributed Computing - Technologies for Distributed Computing

(14 Hrs)

Unit III

Virtualization: Introduction - Characteristics of virtualized environments - Taxonomy of virtualization techniques - Virtualization and cloud computing - Pros and Cons of Virtualization - Technology examples

(12 Hrs)

Unit IV

Cloud Computing Architecture : Introduction - The cloud reference model - Types of clouds - Economics of the cloud - Open challenges

(10 Hrs)

Unit V

Cloud Platforms in Industry : Amazon Web Services - Compute Services - Storage Services - Google AppEngine - Architecture and Core Concepts - Microsoft Azure - Azure Core Concepts.

(10 Hrs)

Books for Study:

1. Mastering Cloud Computing, Rajkumar Buyya, Christian Vecchiola,S. ThamaraiSelvi, Tata McGraw Hill Education Private Limited
2. Mastering Cloud Computing - Foundations and Applications Programming, Rajkumar Buyya, Christian Vecchiola and S. ThamaraiSelvi,MK Publications,

Books for Reference:

1. Cloud Computing: A Practical Approach, Anthony T .Velte, Toby J.Velte, Robert Elsenpeter, Tata McGraw Hill Edition, Fourth Reprint, 2010
2. Cloud Computing, Kumar Saurabh, WileyIndia.
3. Enterprise Cloud Computing Technology Architecture Applications, Gautam,Shroff

Marks including choice:

Unit	Marks
1	12
2	12
3	12
4	12
5	12

CORE COURSE XXI: 6B21BCA LAB V: ENTERPRISE JAVA PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B21BCA	V SEM 3 HRS VI SEM 2 HRS	2	3

COURSE OUTCOME

CO1: Can write and execute simple JDBC Programs.
CO2: Can write and execute simple RMI Programs.
CO3: Can Write and execute simple servlet programs.
CO4: Can write and execute simple CORBA programs.

Sample Program List

A list of 10 Programs are given below. Each student has to complete and record all the exercises. A detailed problem statement shall be prepared by the faculty concerned.

1. JDBC program to insert, Delete and Update records into Employee table.
2. JDBC program to connect to Student table. Implement the record scrolling functions – first(), last(), next(), previous(), beforeFirst(), afterLast(), absolute() and relative().
3. JDBC program to display database metadata.
4. JDBC program to display Resultset metadata.
5. RMI program for Complex number operation.
6. RMI program for Bank operation.
7. Create an HTML form to read student details such as Roll, name,age, sex, qualification, percentage of marks etc. Write a servlet program that displays the same details.
8. Create an HTML form that reads a file name from the user. Write a servlet program that displays the contents of the file, specified by the user.
9. Session handling servlet that displays total number of visits to that page.
10. CORBA program for arithmetic operation.

CORE COURSE XXII: 6B22BCALAB VI: PYTHON PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B22BCA	V SEM 3 HRS VI SEM 2 HRS	3	3

COURSE OUTCOME

Sample Program List

1. Write a program to find the largest from a list of numbers
2. Write a program to generate first n perfect numbers
3. Write a program to perform the binary search
4. Write a program to find the square root of a number using bisection search method.
5. Write a program to generate Fibonacci series using recursion
6. Write a program to find the LCM and GCD of 2 numbers
7. Write a program to perform merge sort
8. Write a program which reads the contents of a file and copy the contents to another file after changing all the letter to upper case. Exceptions should be handled.
9. Write a program to find the prime numbers in a list of numbers.
10. Write a python program to perform the following
    a) Create table students with fields name,sex,rollno,marks
    b) Insert some rows into the table
    c) Update the marks of all students by adding 2 marks
    d) Delete a student with a given rollno
    e) Display the details of a student with a given rollno
11. Create a simple Login window using Tkinter
12. Create a plot for the mathematical function x^2. The title of the plot and the axes should be labelled.

CORE COURSE XXIII: 6B23BCA LAB VII WEB TECHNOLOGY (LAB -VII)

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B23BCA	V SEM 2 HRS VI SEM 2 HRS	2	3

COURSE OUTCOME

Guidelines
1. Follow standard coding method
2. The output of the program should be neatly formatted
3. Practice all the programs in the lab

Sample Program list

1. Develop an HTML page using all basic tags
2. Develop an HTML page to display hotel menu using all types of lists
3. Write an HTML code to insert an image into the web page. Use the attributes height, width and border. Also align some text with respect to the images. The image should have an ALT text in it.
4. Design a HTML page for the following.
    a. Set an image as a link
    b. Open a link in a new browser window
    c. Jump to another part of a document (on same page)
5. Create a web page to display the maximum and minimum temperature of 5 cities using table.
6. Create a web page for your college using frames, images and hyperlink
7. Create a web page that illustrate the onMouseOver and onMouseOut event handlers.
8. Form Validation using Javascript.
9. Create an email registration form. Give necessary validations
10. Write a JavaScript code using arrays
11. Develop an HTML page that accepts any mathematical expression, evaluates that expression and display the result of the evaluation

12. Write a Javascript program to display the current time
13. Write a Javascript program to print the prime numbers within a range
14. Write a Javascript program to show the working of alert ()
15. Write a JavaScript program to find the factorial of a number.
16. Form Processing using PHP
17. Form validation using PHP
18. Storing data in MYSQL using PHP

CORE COURSE XXIV: 6B24BCA PROJECT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B24BCA	5	4	3

Model Question Papers

Model Question Paper-1
5B14BCAPython Programming

Time: 3 Hours **Max. Marks: 40**

Part A: Short Answer

Answer all questions **(6 x 1 = 6 Marks)**

1. Give syntax for function definition in python.
2. What are built-in attribute methods.
3. What is the purpose of zeros function in numpy module?
4. Explain the use of linspace function in numpy with an example?
5. What is meant by widget in Tkinter?
6. Give syntax for connecting to a database in python.

Part B: Short Essay

Answer any 6 questions

(6 x 2 = 12 Marks)

7. What are the different methods to run python?
8. What is the difference between mutable and immutable objects in python?
9. How a module can be created? Give an example.
10. Write a recursive function in python to find the nth Fibonacci number and use it to generate a Fibonacci series of required numbers.
11. Explain about built-in exceptions in python.
12. How a class is defined? Explain with an example.
13. Explain 2 different methods for changing the shape of an array.
14. Explain about message widget.

Part C: Essay

Answer any 4 questions

(4 x 3 = 12 Marks)

15. Explain about sets in python.
16. Explain about branching statements in python.
17. How python can be used to write in to a file? Explain with an example.
18. Explain how operator overloading can be done in python with an example.
19. Explain how transaction control can be done in python.
20. Explain about pack layout manger.

Part D: Long Essay

Answer any 2 questions

(2 x 5 = 10 Marks)

21. Explain in detail about lists and dictionaries in python.
22. Explain about exception handling in python.
23. What are the object-oriented programming features of python?
24. Explain about 5 widgets in Tkinter.

Model Question Paper-2
3B07BCA JAVA PROGRAMMING

Time: 3 Hours **Max. Marks: 40**

Section A

Answer All the questions (6 x 1 = 6 marks)

1. What is a token?
2. What is platform independancy?
3. What do you mean by method?
4. What is the use of t'his' keyword?
5. What are threads?
6. What is GUI?

SECTION B

Write short notes on ANY SIX of the following questions(6 x 2 = 12 marks)

7. How to create and use an one dimensional array in Java?
8. Define an applet.
9. Syntax of try ____ catch statement with multiple catch.
10. Short note on thread groups.
11. Explain APPLET tag.
12. Write about any two methods of button class.
13. Short note on StringBuffer class
14. Explain any two string operations in Java

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

15. Write a Java program to illustrate applet lifecycle.
16. Short note on Thread Priorities in Java.
17. Write an overview of filter streams in Java.
18. What do you mean by event listeners in Java?
19. What is thread synchronization. Explain.
20. Explain exception handling in Java.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

21. Write a program to handle exceptions with multiple catch block.
22. Explain the AWT controls.
23. With suitable example, explain packages in java.
24. Write a Java program to create a thread by extending thread class.

Model Question Paper-3
4B08BCA OPERATING SYSTEMS

Time: 3 Hours **Max. Marks: 40**

SECTION A

Answer ALL Questions (6 x 1=6)

1. Define OS
2. List out different process states
3. Mention different process scheduling criteria's
4. What is internal fragmentation
5. What is rotational latency
6. List out different types of files

SECTION B

Answer ANY SIX of the following Questions(6 x 2=12)

7. What are the functions of an OS?
8. Write a short note on microkernals
9. Write a short note on PCB
10. Mention about conditions for deadlocks
11. Differentiate between paging and segmentation
12. Write a short note on overlays
13. What is seek time
14. Write a short note on file attributes

SECTION C

Write an essay on ANY FOUR of the following Questions(4 x 3=12)

15. With example explain system calls
16. Explain IPC
17. With example explain LRU page replacement algorithm
18. Explain segmentation
19. Explain about RAID
20. with example explain Access matrix

SECTION D

Write Long essay on ANY TWO of the following Questions (2 x 5=10)

21. OS is a resource manager. Explain
22. Explain the techniques for handling deadlocks
23. Explain any 4 disk scheduling algorithms in detail
24. Explain different directory structures

Model Question Paper-4

5B13BCA ENTERPRISE JAVA PROGRAMMING

Time: 3 Hours **Max. Marks: 40**

SECTION A

Answer All the questions (6 x 1 = 6 marks)

1. What is IDL?
2. What is RMI?
3. What are the packages used in a servlet API?
4. How can you load or register the driver in JDBC?
5. List the different init() functions in ORB.
6. Explain the JDBC URL.

SECTION B

Write short notes on ANY SIX of the following questions (6 x 2 = 12 marks)

7. What is SQL exception?
8. How can you create data members and methods in IDL?
9. What are cookies?
10. What is CORBA?
11. Explain servlet lifecycle.
12. What are RMI stubs and skeltons?
13. What are BLOB and CLOB?
14. How can you configure clients and servers for remote class loading.

SECTION C

Answer ANY FOUR of the following questions (4 x 3 = 12 marks)

15. Write short note on different kinds of statements in JDBC.
16. Describe Java classes generated in an IDL interface.
17. What is a CORBA naming service?
18. With suitable examples explain DatabaseMetaData and ResultsetMetaData.
19. Describe session tracking in servlet.
20. Explain error handling in servlets.

SECTION D

Write an essay on ANY TWO of the following questions (2 x 5 = 10 marks)

21. Explain the JDBC architecture with a sample program.
22. Describe the elements of the Servlet API.
23. Explain the RMI architecture, with a diagram.
24. Explain the CORBA architecure.

PART B

BCA GENERIC ELECTIVECOURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

STUDENTS OF OTHER DEPARTMENTS CAN CHOOSE **ANY ONE OF THE GENERICELECTIVECOURSESFROM THE POOL OFFIVE COURSES.**

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS (INTERNAL + EXTERNAL)
5D01BCA	PROGRAMMING WITH C	5	2	2	2	5+20
5D02BCA	WEB TECHNOLOGY	5	2	2	2	5+20
5D03BCA	DATABASE MANAGEMENT SYSTEM	5	2	2	2	5+20
5D04BCA	CYBER LAW	5	2	2	2	5+20
5D05BCA	FUNDAMENTALS OF COMPUTERS AND PROGRAMMING	5	2	2	2	5+20

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

CONTINUOUS INTERNAL ASSESSMENT FOR THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT1: TEST	80%	MINIMUM OF 2 TESTS SHOULD BE CONDUCTED. MARKS FOR THE TEST COMPONENT SHOULD BE CALCULATED AS THE AVERAGE OF THE BEST TWO MARKS OBTAINED IN THE TESTS CONDUCTED.
COMPONENT 2: ASSIGNMENT/ SEMINAR/VIVA	20%	ANY ONE COMPONENT

PATTERN OF QUESTION PAPER FOR END SEMESTER ASSESSMENT

Part A	**Short Answer**	**6 Questions x 1 Mark = 6 Marks**
	Answer all questions	6 Questions x 1 Mark = 6 Marks
Part B	**Short Essay**	**6 Questions x 2 Marks = 12 Marks**
	Answer any 4 questions	4 Questions x 2 Marks = 8 Marks
Part C	**Essay**	**2 Questions x 6 Marks = 12 Marks**
	Answer any 3 questions	1 Question x 6 Marks = 6 Marks
Total Marks Including Choice: 30		
Maximum Marks for the Course: 20		

GENERIC ELECTIVE COURSE: 5D01BCA PROGRAMMING WITH C

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D01BCA	2	2	2

COURSE OUTCOME

CO1: *Understanding the basic concepts in programming.*
CO2: *Familiarize the basic syntax and semantics of C language.*
CO3: *Familiarize with advanced features of C*
CO4: *Develop skill in programming*

Unit I

The C character set, Identifiers and keywords, Classes of Data Types, constants, variable declarations. Expressions, statements, operators and expressions: arithmetic operators, unary operators, relational operator, logical operators, assignment operator, the conditional operator. Library functions: data input and output functions like getchar(), putchar(),scanf(), printf(), gets and puts.

(10 Hrs)Unit II

Control statements: Branching: The if-else statements. Looping: The while, do-while and for loops. The switch statements, Break and continue, comma operator.

(8 Hrs)

Unit III

Functions, defining a function, accessing a function, function prototype, passing arguments to a function, Returning from a function, recursion, program structure. Storage classes: automatic, static, register and extern(global).

(8 Hrs)

Unit IV

Arrays, Structure and Union: Defining an array, processing an array, passing arrays to functions, multidimensional arrays. Structure and union. Defining a structure, processing a structure. Union.

(5 Hrs)

Unit V:

Strings: Basic concepts, standard library string functions- strlen, strcpy, strcmp, strcat&strrev.

(5 Hrs)

Books for Study:

1. E. Balaguruswamy, Programming in ANSI C, 7th Ed, TMH

Books for Reference:

1. V. Rajaraman, Computer Basics and C Programming, PHI
2. Ashok N. Kamthane, Programming with ANSI and Turbo C, Pearson
3. Yeshavant Kanetkar, Let Us C, 16th Ed, BPB
4. Noel Kalicharan, C by Example, Cambridge University Pres

Marks including choice:

Unit	**Marks**
1	6
2	6
3	6
4	6
5	6

GENERIC ELECTIVE COURSE: 5D02BCA WEB TECHNOLOGY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D02BCA	2	2	2

COURSE OUTCOME

CO1: *Enable students to program for the World Wide Web using HTML, JavaScript.*
CO2: *Create static and dynamic web pages.*
CO3: *Impart basic knowledge in Client-server model.*

UNIT I

Introduction to Internet and WWW, Introduction to HTML, structure of HTML, HTML elements, attributes, syntax of tags , starting and ending tags, physical style tags, listing, labeling, grouping, images and linking

(6 Hrs)

UNIT II

HTML Tables-tags-<tr>,<td>,<th> attributes. HTML Form-tag, attributes-type-passwd, submit, radio, check, method, action.

(8Hrs)

UNIT III

Frames-<frame>, <frameset>, <iframe>,<noframe> and other important tags and attributes. Simple programs using frames.

(6 Hrs)

UNIT IV

Javascript- Introduction, data types, variables, operators, functions, objects, arrays. Client-side object hierarchy and document object Model, <script>, event handlers, javascript in urls.

(8Hrs)

UNIT V

Windows and frames-dialog boxes, status line, navigator object, opening Windows, closing windows, Location object, history object.- Date object- math object-Accessing form object

(8Hrs)

Books for Study:

1. Bill Kennedy, Chuck Musciano, HTML: The Definitive Guide, 3rd Ed, O'Reilly Media
2. Flanagan David, JavaScript: The Definitive Guide, 6th Ed, O'Reilly Media

Books for Reference:

1. Thomas A. Powel, HTML & CSS: The Complete Reference, 5th Ed, TMH

Marks including choice:

Unit	Marks
1	6
2	6
3	6
4	6
5	6

GENERIC ELECTIVE COURSE: 5D03BCA DATABASE MANAGEMENT SYSTEM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D03BCA	2	2	2

COURSE OUTCOME

CO1: To understand the fundamentals of database management system
CO2: To develop Skill in designing database
CO3: To understand the concept of SQL commands
CO4: To develop Skill in writing queries

Unit I

Introduction–Field,Record,Entity,Attribute,Relation,Domain,Tuple-advantages of database systems- data models (Network model, Hierarchical Model, DBTG CODASYL model, Relational Model(E-R)) - system structure.

(8 Hrs)

Unit II:

Database administrator- data base users, Constraints (Primary, Foreign, Candidate, Unique)- Relational Algebra (Union, Intersection, Difference, Product, Project, Selection).

(8 Hrs)

Unit III:

SQL: Introduction to SQL, database languages, DDL(create, alter, Drop), DML(Insert into, Select, update, Delete) and DCL commands. Data Types in SQL

(8 Hrs)

Unit IV:

SQL Functions(Different Types of Functions), Operators (Arithmetic, Relational, Logical), Sub Quires (in Detail), Clauses (Having, Group By)

(6 Hrs)

Unit V:

Joins(Different Types of Join Statements), View, Introduction to Sequence

(6 Hrs)

Books for Study:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts, 6th Ed, TMH
2. Narain Gehani, The Database Book Principles and Practice Using MySQL, University Press

Books for Reference:

1. Elmasri Ramez and Navathe Shamkant, Fundamentals of Database System, 7th Ed, Pearson

Marks including choice:

Unit	**Marks**
1	6
2	6
3	6
4	6
5	6

GENERIC ELECTIVE COURSE: 5D04BCA CYBER LAW

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D04BCA	2	2	2

CO1: To understand the fundamentals of cyber law
CO2: To know about different types of cyber crimes
CO3: To understand about Intellectual Property Rights

UNITI

Fundamentals of Cyber Law: Jurisprudence of Cyber Law- Overview of Computer and Web Technology- Introduction to Indian Cyber Law- Overview of General Laws and Procedures in India; Freedom of Expression on the Internet.

(8 Hrs)

UNIT II

Cyber Crimes: Meaning of Cyber Crimes –Cybercrimes under IPC, Cr.P.C and Indian Evidence Law

(8 Hrs)

UNIT III

Cybercrimes under the Information Technology Act,2000 - Cybercrimes under International Law

(8 Hrs)

UNIT IV

Hacking Child Pornography, Cyber Stalking, Denial of service Attack, Virus Dissemination, Software Piracy, Internet Relay Chat (IRC) Crime, Credit Card Fraud, Net Extortion, Phishing etc

(8 Hrs)

UNIT V

Intellectual Property Issues and Cyberspace: The Indian Perspective; Overview of Intellectual Property related Legislation-Copyright law & Cyberspace.

(4 Hrs)

Books for Study:

1. Information Technology law and Practice, Sharma,Vakul , Universal law Publishing, 2011
2. Cyber law, Rattan, Jyoti. New Delhi: Bharat law House,2011.

Books for Reference:

1. Guide to Cyber Laws, Rodney D. Ryder, 2nd Edit, Wadhwa and Company, NagpurSeth,Kanika.
2. Cyber Law in the Information Technology Act. Nagpur : Lexis Nexis Butterworth Wadhwa,2009
3. Guide of Cyber Law , Rodney D.Ryder,2nd Edition.
4. Cyber Law , Faruq Ahmed, in India.

Marks including choice:

Unit	Marks
1	6
2	6
3	6
4	6
5	6

GENERIC ELECTIVE COURSE: 5D05BCA FUNDAMENTALS OF COMPUTERS AND PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
5	5D05BCA	2	2	2

COURSE OUTCOME

CO1: To know the working principle of a computer
CO2: To understand the concept of number system
CO3: To understand the basics of computer network
CO4: To understand the basics of programming

Unit I:

Introduction to Computers: Characteristics, Generation, Basic operations of a computer system: Inputting, storing, processing, outputting and controlling, CPU, ALU, Control Unit, Main Memory Unit, Secondary storage devices: tape, floppy, hard disk, CD, DVD.

(12Hrs)

Unit II:

Representation of information: Number system: binary, octal and hexadecimal system, Conversion: decimal to binary, decimal to octal, decimal to hexadecimal, binary to decimal, octal to decimal and hexadecimal to decimal, Different code used: BCD, ASCII, EBCDIC, and GRAY Code.

(8Hrs)

Unit III:

Introduction to Computer networking: Goals, Transmission modes: simplex, half duplex and full duplex, Classification of networks: LAN, MAN and WAN, Topologies: bus, star, ring, and mesh.

(8 Hrs)

Unit IV:

Computer Programming: Introduction, algorithm, flowchart, characteristics of a good program. Programming languages: machine, assembly and high-level languages, Assembler, Compiler and Interpreter. Source code and object code.

(8Hrs)

Books for Study:

1. Computer Fundamentals, Pradeep.K. Sinha &Priti Sinha, BPB Pub
2. Introduction to Information Technology, V. Rajaraman, Prentice Hal
3. Computer Networks 3rd Edn, A S Tanenbaum . Pearson Pub

Books for Reference:

1. Peter Norton, Introduction to Computers,6e, (Indian Adapted Edition)
2. B Forouzan, Introduction to data communication and networking

Marks including choice:

Unit	Marks
I	9
II	6
III	8
IV	7

Model Question Papers

GENERIC ELECTIVE COURSE FOR SEMESTER V

Model Question Paper-1
5D04BCACYBER LAW

Time: 2 Hours **Max. Marks: 20**

Part A

Answer all questions (*6 questions x Mark 1each* = *6*)

1. Freedom of expression is a very important value in our society, but the right to express yourself or give your opinion about a person has its limits.(True/False)
2. ---------- is created inciting a religious group to act or pass objectionable remarks against a country, national figures etc.
3. --------------are the c**rimes w**hich are committed with the use of any electronic system, network or device.
4. Section ------ of the Indian Penal Code is dealing with stalking.
5. Which protocol is a service that allows people to chat with each other online?
6. What is patent infringement?

Part B

Answer any 4 questions *(4 questions x Marks 2 each=8)*

7. Comment on 'Cyber Law'
8. Describe Indian Evidence Law in detail.
9. Under the Cybercrimes of International Law what are Content-related offences?
10. Explain Credit Card Fraud, Net Extortion.
11. Write notes on Software Piracy.
12. Explain the role of Cyber Law in 'Intellectual Property'

Part C

Answer any 1 questions *(1 questions x Marks 6 each=6)*

13. Discuss any six cybercrimes by giving the section, particulars and punishment for the offence.
14. Explain at least two reasons for establishing the patent system

KANNUR UNIVERSITY
(Abstract)

B.Com Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12281/2019 Dated, Civil Station P.O.,20.06.2019

Read:-
1. U.O.No.Acad.C2/429/2017 dated.10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O.No.Acad.C2/429/2017 Vol.II dated.03-06-2019.
4. The Minutes of the Meeting of the Board of Studies in Commerce (UG) held on 07.06.2019
5. Syllabus of B.Com.Programme, submitted by the Chairperson, Board of Studies in Commerce (UG), dated 12.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2.The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed different phases of Syllabus Revision processes such as conducting the meetings of various Boards of Studies and Workshops, discussions etc.

3.The Revised Regulations for UG programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) were implemented with effect from 2019 Admission as per paper read (3) above.

P.T.O

4.As per paper read (4) above, the Board of Studies in Commerce (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Com Programme to be implemented with effect from 2019 Admission.

5.As per paper read (5) above, the Chairperson, Board of Studies in Commerce (UG) has submitted the final copy of the Scheme, Syllabus & Pattern of Question Papers of B. Com Programme for implementation with effect from 2019 Admission.

6.The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(i) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) for B.Com programme under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting before the Academic Council.

7.The Scheme, Syllabus & Pattern of Question Paper of B.Com.Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
for REGISTRAR

To
The Principals of Colleges offering B.Com Programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Commerce (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, COMMERCE (UG)

SYLLABUS FOR
CORE COURSES, GENERAL AWARENESS COURSES,
COMPLEMENTARY ELECTIVE COURSES
FOR B.COM DEGREE PROGRAMME
AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY
VISION AND MISSION

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO 1.Critical Thinking:

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

INTRODUCTION

The Board of Studies of Commerce (UG) as per the direction of Kannur University has decided to introduce outcome based course syllabus for the undergraduate Programme in commerce with effect from the academic year 2019-20. The process of revising and restructuring the syllabus was undertaken in compliance with the national education policy of the University Grants Commission, the directions of the Kerala State Higher Education Council and Kannur University. This revised syllabus is the result of a series of meetings of the board of studies and workshop of college teachers conducted for this purpose. Suggestions and recommendations of scholars, teachers, students and other eminent persons in the area of commerce were taken in to consideration while drafting the new syllabus. Due care has been taken to make the new curriculum up to date, pertinent for the current scenario and in tune with the industrial requirements

I express my sincere gratitude to all members of the Board of Studies of commerce (UG), all scholars and faculty members who helped to fulfill this task.

Dr. RAJESH KUMAR .E. R
CHAIRMAN
Board of Studies, Commerce (UG)

KANNUR UNIVERSITY

PROGRAMME SPECIFIC OUTCOME OF B.COM DEGREE

After the successful completion of the B.Com Degree Pragramme, the students shall be able to;

PSO 1:

Understand the concepts and techniques of commerce and its application in business environment

PSO 2:

Conceive the ideas on entrepreneurship and develop the skills for setting up and management of business organizations

PSO 3:

Develop the skills and abilities to become competent and competitive in the business world

PSO 4:

Develop the competency to take wise decisions at personal and professional level

PSO 5:

Appraise the impact of other disciplines on the working of business

INDEX

KANNUR UNIVERSITY
B.COM DEGREE PROGRAMME

COURSE AND CREDIT DISTRIBUTION STATEMENT

Courses	No of Courses		Credit	
English Common Course (ECC)		4		14
Additional Common Course (ACC)		2		8
Core Courses:				
Discipline Specific Core Course (DSCC)	13	17	48	64
Discipline Elective Core Course (DECC)	4		16	
General Awareness Course (GAC)		4		16
Complimentary Elective Course (CEC)		4		16
Generic Elective Course (GEC)		1		2
Total		**32**		**120**

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title	Type of Course	Credits	Hours per week
I	English Common Course I	ECC	4	5
	English Common Course II	ECC	3	4
	Additional Common Course I	ACC	4	5
	Management Concepts and Principles (1B01 COM)	DSCC	4	5
	Business Statistics and Basic Numerical Skills(1A11 COM)	GAC	4	6
	TOTAL		**19**	**25**
II	English Common Course III	ECC	4	5
	English Common Course IV	ECC	3	4
	Additional Common Course II	ACC	4	5
	Functional Applications of Management (2B02 COM)	DSCC	4	5
	Quantitative Techniques for Business Decisions (2C01 COM)	CEC	4	6
	TOTAL		**19**	**25**
III	Entrepreneurship development (3A12 COM)	GAC	4	5
	Advanced Accounting (3B03 COM)	DSCC	4	6
	Course I from Elective Stream I/II/III/IV (3B04 COM)	DECC	4	5
	Business Regulatory Framework (3C02 COM)	CEC	4	4
	Business Economics (3C03 COM)	CEC	4	5
	TOTAL		**20**	**25**

Semester	Course Title	Type of Course	Credits	Hours per week
IV	General Informatics Skills (T+P) (4A13 COM)	GAC	4(3+1)	5(3+2)
	Environmental Studies and Disaster Management (4A14 COM)	GAC	4	5
	Corporate Accounting (4B05 COM)	DSCC	4	6
	Course II from Elective Stream I/II/III/IV (4B06 COM)	DECC	4	5
	Corporate Law and Business Regulations (4C04 COM)	CEC	4	4
	TOTAL		**20**	**25**
V	Business Research Methodology (5B07 COM)	DSCC	3	4
	Income Tax law and Practice (5B08 COM)	DSCC	4	5
	Cost Accounting (5B09 COM)	DSCC	4	5
	Banking Principles and Operations (5B10 COM)	DSCC	4	5
	Course III from Elective Stream I/II/III/IV (5B11 COM)	DECC	4	4
	Generic Elective Course (5D-- COM)	GEC	2	2
	TOTAL		**21**	**25**
VI	Financial Markets and Services (6B12 COM)	DSCC	3	4
	Management Accounting (6B13 COM)	DSCC	4	5
	Auditing and Corporate Governance (6B14 COM)	DSCC	4	5
	Income Tax and GST (6B15 COM)	DSCC	4	5
	Course IV from Elective Stream I/II/III/IV (6B16 COM)	DECC	4	4
	Project (6B17 COM)	DSCC	2	2
	TOTAL		**21**	**25**

Industrial Visit

The forth/fifth semester students of regular colleges shall be taken under the supervision of faculty members to business or industrial units so as to enable them to have a direct knowledge about location, layout, managerial function, HR management or any area of study. The study tour to an industrial/business unit will form a part of the curriculum. The report submitted by the students in this respect shall be considered as one of the assignment of any one course in the concerned semester.

PART A:

B.COM CORE COURSES

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
1B01 COM	Management Concepts and Principles	I	5	4	3
2B02 COM	Functional Applications of Management	II	5	4	3
3B03 COM	Advanced Accounting	III	6	4	3
3B04 COM	Elective Course I	III	5	4	3
4B05 COM	Corporate Accounting	IV	6	4	3
4B06 COM	Elective Course II	IV	5	4	3
5B07 COM	Business Research Methodology	V	4	3	3
5B08 COM	Income Tax law and Practice	V	5	4	3
5B09 COM	Cost Accounting	V	5	4	3
5B10 COM	Banking Principles and Operations	V	5	4	3
5B11 COM	Elective Course III	V	4	4	3
6B12 COM	Financial Markets and Services	VI	4	3	3
6B13 COM	Management Accounting	VI	5	4	3
6B14 COM	Auditing and Corporate Governance	VI	5	4	3
6B15 COM	Income Tax and GST	VI	5	4	3
6B16 COM	Elective Course IV	VI	4	4	3
6B17 COM	Project	VI	2	2	-

ELECTIVE STREAMS

I - CO-OPERATION

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Co-operative Principles	III	5	4	3
4B06 COM	Management of Co-operatives	IV	5	4	3
5B11 COM	Co-operative laws	V	4	4	3
6B16 COM	Co-operative Accounting and Legislations	VI	4	4	3

II - COMPUTER APPLICATION

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Introduction to Computers and Networks	III	5	4	3
4B06 COM	Data Base management System	IV	5	4	3
5B11 COM	Information Technology for Business	V	4	4	3
6B16 COM	Accounting Packages - TALLY	VI	4	4	3

III - FINANCE

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Financial Management	III	5	4	3
4B06 COM	Investment Management	IV	5	4	3
5B11 COM	Goods and Service Tax	V	4	4	3
6B16 COM	Corporate Tax Planning	VI	4	4	3

IV - MARKETING

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
3B04 COM	Marketing Principles	III	5	4	3
4B06 COM	Consumer Behaviour	IV	5	4	3
5B11 COM	Promotion Management	V	4	4	3
6B16 COM	Market Research	VI	4	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	4	40*
INTERNAL	1	10

* 20 marks for theory and 20 marks for practical for courses having practical

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS	REMARKS
COMPONENT 1 Test paper	3	6	Minimum two test papers and mark should be awarded on the basis of average mark obtained by the student
COMPONENT 2 Assignments/ Seminar	2	4	Department should keep a record of the work done

Internal mark for test papers should be given as per the following criteria;

Average mark obtained in the test papers	Percentage of internal mark
80% and above	100%
60% to 79%	80%
40% to 59%	60%
20 % to 39%	40%
Below 20%	20%

CORE COURSE I : - MANAGEMENT CONCEPTS AND PRINCIPLES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1B01 COM	5	4	3

COURSE OUTCOME

After studying the course, students shall be able to;

CO1:- Understand the evolution of management thoughts, concept of management, scope and its functions.
CO2:- Familiarize with current management practices.
CO3:- Understand the importance of ethics in business.
CO4:- Acquire knowledge and capability to develop ethical practices for effective management.
CO5:- Describe the emerging trends in management.

Unit I

Management Concepts: Evolution of Management thoughts: Classical approaches - Scientific management, administrative management and bureaucracy- Neo classical approaches – Human relations and Behavioral approach - Modern approaches- Quantitative approach, systems approach, and contingency approach.

[15 Hours]

Unit II

Functions of management-: Planning-concept and importance - Planning process- Steps in Planning—barriers to effective planning-- Organizing- Nature and purpose of organization-Types of organization – line, functional, line and staff - Staffing: Concepts - manpower planning – process and importance

[18 Hours]

Unit III

Functions of management -: Directing: Meaning-definition- principles –techniques of direction. Motivation:- concept and importance – Theories : Maslow's Need Hierarchy – Herzberg –Theory X and Theory Y – Leadership: concept – styles – leadership and management-– Controlling: meaning-definition-essentials of effective control system.

(17 Hours)

Unit IV

Business Ethics: Meaning and scope – Types of ethics – Characteristics – Factors influencing business ethics – Arguments for and against business ethics – Basics of business ethics - Corporate social responsibility - Environmental issues in business-Ethics in advertising-Globalization and business ethics .

[20 Hours]

Unit V

Emerging concepts in management – Kaizen – TQM – TPM – MIS – ISO – Change management – Stress management – Fish bone (ISHIKAWA) Diagram – Business eco system – Logistic management.

[20 Hours]

References:

1. Boatwright. John R: Ethics and the Conduct of Business, Pearson Education, New Delhi.
2. Gupta. CB; Business management, Sultan Chand & sons
3. Koontz, H and Wechrick, H: Management, McGraw Hill Inc, New York.
4. Prasad. LM; Principles and Practice of Management; Sultan Chand & sons
5. Stoner. AF and Freeman RE; Management; Prentice Hall of India
6. Drucker, Peter, F., Management: Tasks, Responsibilities and Practices, Allied Publishers, New Delhi. 5. R.S Davar; Management Process 6. Rustum & Davan, Principles and Practice of Management.
7. Srinivasan & Chunawalla, Management Principles and Practice. 8. S. V. S. Murthy. Essentials of Management.

Marks including choice:

Unit	Marks
I	10
II	12
III	12
IV	12
V	10
TOTAL	56

CORE COURSE II : FUNCTIONAL APPLICATIONS OF MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B02 COM	5	4	3

COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: Describe nature and scope of financial management and the elements in the management of finance
CO 2: Enumerate marketing management and its different aspects
CO 3: Explain Human Resources Management and the activities involved in it
CO 4: Understand the modern global marketing trends and its challenges

Unit 1 Financial Management

Concept of finance- Functions of finance - Meaning, scope and objectives of financial management – financial planning- sound financial plan capitalisation- overcapitalisation – under capitalisation- (meaning only) capital structure, factors determining capital structure- fixed capital – working capital – factors determining fixed and working capital- Source of finance- short term and long term,

(20Hrs)

Unit II

Marketing Management

Marketing-Meaning- nature and importance of marketing -functions of marketing - concept of modern marketing - marketing mix –elements – importance - product life cycle – stages of PLC and marketing strategies - Concept of branding and brand equity –- market segmentation – concept – bases – patterns and significance –Target marketing -product positioning.

(20 hrs)

Unit III

Marketing in the globalised scenario – Digital marketing/ on line marketing / E Commerce – features – scope and challenges – Social media marketing – Relationship marketing –– Social marketing - Direct marketing – Net work marketing / MLM– service marketing-scope – service marketing mix.

(15 hrs)

Unit IV

Human Resource Management.

Meaning definition, evolution, personnel management, functions and importance of HRM, duties and qualities of HR Manager .HR Planning, job analysis, description and job specification job evaluation, recruitment, sources of recruitment, selection process, interview, tests, placement and induction.

(20 hrs)

Unit V

Performance appraisal system: Meaning, objectives, methods and problems of performance appraisal. Training, need and importance, methods. Benefits of training. HRM in the post globalization era. HRM and competitive advantage

(15 hrs)

References:

1. Tripathy Reddy, Principles of Management, Tata Mc Graw Hill Publishers, New Delhi.
2. L.M. Prasad, Principles of Management, sultan Chand & sons, New Delhi.
3. M.Y. Khan and P.K. Jain, Financial management, Tata Mc Grawhill Publishers, New Delhi.
4. R.S. Goel, Operations management, Kalyani Publications, Ludhiana.
5. R. C. Agarwal, Marketing Management, Educational publishers, Agra.
6. Philip Kotler and Gary Armstrong, Principles of Marketing, PHI, New Delhi.
7.William. J .Stanton, Fundamentals of Marketing, McGraw-Hill, New York
8. Rajan Nair, Marketing Management**,** Sultan Chand & Sons, New Delhi.
9. **C**. B. Mamoria, Personnel Management**,** Sultan Chand&Sons, New Delhi.
10. I M. Pandey, Financial Management, Vikas Publishing House, New Delhi

Marks including choice:

Unit	Marks
I	12
II	12
III	10
IV	12
V	10
Total	56

CORE COURSE III : ADVANCED ACCOUNTING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B03 COM	6	4	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1. Understand the theoretical and practical knowledge of the basics of accounting.
CO 2. Acquire the knowledge of accounting for royalty, Consignment and Hire Purchase
CO 3. Imbibe the accounting concepts of Inland Branch Business.
CO 4. Comprehend the procedure for determining profit and financial position from incomplete records.

Unit I :

Introduction to Accounting: meaning and objectives of Accounting – Journal – Ledger – Trial Balance - Final Accounts of Sole Trading Concern – Manufacturing Account - preparation of Trading and Profit and Loss Accounts – preparation of Balance Sheet – Adjusting and Closing Entries.

(25 Hrs)

Unit II :

Royalty accounts: meaning – minimum rent – short workings – recoupment of short workings – accounting procedures in the books of the parties- (sub lease not required)

(18 Hrs)

Unit III:

Accounts of Special Transactions: Consignment Accounts – concepts – accounting treatment – cost price and invoice price – unsold stock – loss of goods - Hire purchase Accounting – meaning and objectives - ledger accounts in the books of Hire vendor and Hire Purchaser – Full Cash Price, Actual Cash Price and Interest Suspense Methods ((HP trading account not required) - interest calculations – ascertainment of Cash Price – repossession – Instalment System (meaning only) - differences between Hire Purchase and Instalment Systems.

(25 Hrs)

Unit IV:

Inland Branch Accounts: Accounts of dependent and independent branches – Debtors system, Stock and Debtors System (at cost price and invoice price) – Incorporation of branch Trial Balance in the books of H.O. - Preparation of consolidated accounts.

(20 Hrs)

Unit V:

Accounts from Incomplete Records: Single Entry meaning- features -0 difference between single entry and double entry system - Methods of profit determination –Capital comparison method - Conversion method.

(20 Hrs)

References :

1. Advanced Accounting :M.C.Shukla&T.S.Grewal
2. Advanced Accounting :R.L.Guptha
3. Advanced Accounting :S.N.Maheshwari
4. Advanced Accounting :B.S.Raman
5. Advanced Accounting : Ashok Sehgal& Deepak Sehgal
6. Advanced Accounting :S.K.R.Paul
7. Advanced Accounts VolumeII : Shukla: M.C., T.S.Grewal and S.C.Guptha (S.Chand&Co.,New Delhi)
8. Advanced Accountancy, Volume II :Guptha R.L. and M.Radhaswami (Sulthan Chand & Co. New Delhi)
9. Financial Accounting :B.K.Banerjee (PHI Pvt.Ltd.New Delhi)

Marks including choice:

Unit	**Marks**
I	8
II	10
III	16
IV	12
V	10
Total	56

CORE COURSE V : CORPORATE ACCOUNTING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B05 COM	6	4	3

COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: Understand the mode of presentation and understanding of financial reporting .
CO 2: Learn the accounting procedure for recording transaction relating to the issue and redemption of shares and debentures.
CO 3: Imbibe the techniques of recording transactions in respect of amalgamation, reconstruction and liquidation of companies..
CO 4: Understand the concept of IFRS and Ind AS

Unit I :

Issue of shares and debentures:

Issue of shares – issue at par, premium and discount – under and over subscription – pro-rata allotment - calls in arrear – calls in advance – forfeiture and reissue – redemption of preference shares – redemption out of profit and out of proceeds of fresh issue – issue and redemption of debentures- redemption by purchase (only)

(20 Hrs)

Unit II: Final Accounts of Companies:

Preparation of Balance Sheet and Profit & Loss Account (in new format) – compulsory transfer to Reserve (Corporate dividend tax need not be considered). Computation of Profit prior to incorporation

(25 Hrs)

Unit III: Accounting for Amalgamation and reconstruction:

Meaning and types of amalgamation – purchase consideration – methods of ascertaining purchase consideration - Amalgamation in the nature of Merger and Amalgamation in the nature of purchase – differences – methods of accounting – Pooling of interest method and purchase method — accounting entries in the books of both transferor and transferee companies (excluding intercompany holdings) – reconstruction – types – External and Internal reconstructions – Accounting entries only.

(30 Hrs)

Unit IV: Liquidation of companies:

Meaning and types of winding up – Statement of Affairs – Deficiency or Surplus Accounts – Liquidator’s Final Statement of Account.

(15 Hrs)

Unit V: Accounting Standards for Financial Reporting:

Objectives and uses of financial statements for users – Role/objectives of accounting standards - Development of accounting standards in India - Requirements of international accounting standards -International organizations engaged in accounting harmonization - IASB – FASB Role of IASB in developing IFRS - IFRS adoption or convergence in India -Implementation plan in India - Ind AS - Differences between Ind AS and IFRS -Conceptual framework - Definition of financial elements - Principles of recognition, measurements, presentation and disclosure.

(18 Hrs)

Books for Reference:

1. Advanced Accounts VolumeII : Shukla: M.C., T.S.Grewal and S.C.Guptha (S.Chand&Co.,New Delhi)
2. Advanced Accountancy, Volume II :Guptha R.L. and M.Radhaswami (Sulthan Chand & Co. New Delhi)
3. Corporate Accounting :Maheshwari. S.N. and S.K.Maheshwari, (Vikas publishing House, New Delhi)
4. Corporate Accounting : Ashok Sehgal and Deepak Sehgal,(Taxman Publication, New Delhi)
5. Corporate Accounting : S.P. Jain and K.L.Narang (Kalyani Publishers, New Delhi)
7. Financial Accounting :B.K.Banerjee (PHI Pvt.Ltd.New Delhi)

Marks including choice:

Unit	Marks
I	10
II	12
III	18
IV	10
V	6
Total	56

CORE COURSE VI1: BUSINESS RESEARCH METHODOLOGY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B07 COM	4	3	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: Understand the fundamental aspects of research in business
CO2: identify and define research problem
CO 3: formulate research plan
CO 4: understand various methods of collecting data
CO 5: prepare research report themselves

Unit I: Introduction to Research

Meaning and Definition of Research, Purpose, Types of research, Criteria of good research, Scientific method and its basis – Induction and Deduction, Business Research – Meaning, scope, Functions; Steps in Research process (a brief description only)

(15 Hrs)

Unit II: Research Problem

Meaning and Definition, sources of problem, Formulation of problem, criteria of a good research problem

(10 Hrs)

Unit III: Research Design

Meaning, Importance, Concepts related to research design, types of research design- Exploratory, Descriptive/ Diagnostic, Experimental/ Hypothesis testing research designs, Contents of research design.

(10 Hrs)

Unit IV: Sampling Design

Meaning of Sampling, Sample, Sample frame, Sample size; Methods of Sampling- Probability and non-probability sampling techniques, Steps for selecting sample

(13 Hrs)

Unit V: Data Collection

Meaning and types of data: Primary and Secondary data; Methods of collecting primary data; Secondary data- Meaning, sources, Precautions to be taken before using secondary data.

(12 Hrs)

Unit VI: Report writing

Meaning, qualities of a good report, types, steps in report writing, Layout of research report- Prefatory items, Main body, Terminal items.

(12 Hrs)

References:

1. C.R. Kothari: Research Methodology, New Age International Publishers
2. O.R. Krishnaswamy: Research Methodology, Himalaya Publishing House
3. P. Saravanavel: Research Methodology
4. O.R. Krishnaswamy & M. Ranganatham: Methodology of research in Social Sciences, Himalaya Publishing House
5. Shashi K Gupta & Praneet Rangi: Business Research Methods, Kalyani Publishers
6. L.R. Potti: A text book of Business Research Methods, Yamuna Publications

Marks including choice:

Unit	Marks
I	10
II	08
III	10
IV	08
V	10
VI	10
Total	56

CORE COURSE VIII : INCOME TAX LAW AND PRACTICE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B08 COM	5	4	3

COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1 Define the basic concepts in Income tax, explain its evolution
CO 2 Determine the residence and incidence of Tax
CO 3 Understand the incomes exempt from tax of an individual
CO 4 Compute income under different heads of income

Unit I :

Introduction to Income Tax – Evolution of Income Tax – Income Tax Act 1961 - Finance Act – Income Tax Rules 1962 – Basic Concepts – Definition of different terms – Agricultural Income – Capital and Revenue Receipts – Expenditure and Losses .

(10 Hours)

Unit II :

Residence and Incidence of Tax - Determination of Residential Status of different types of assesses – problems – scope of total income – incomes exempt from tax (for individual assesses) – problems – computations – tax holiday.

(15 Hours)

Unit III:

Heads of Income – Incomes included under salary – allowances – perquisites and their valuation – profits in lieu of salary – Provident Fund – computation of income from salary - Income from house property – basis of charge – annual value in different cases – self occupied – let out – vacancy and unrealized rent – deductions - computation of income from house property

(30 Hours)

Unit IV:

Profits and gains of business or profession – meaning of business – profession – vocation – basis of charge – general principles – deduction in computing business income – computation of profits from business – deduction in computing professional income – computation of gain from profession – depreciation – block of assets – written down value method- Capital gain – basis of charge – capital asset – short term and long term – transfer – capital gain in special cases – exemption from capital gain – computation of income from capital gain

(25 Hours)

Unit V:

Income from other sources – basis of charge – general and specific items of income – interest on securities – deductions allowable – computation of income from other source .

(10 Hours)

Note : Consider the Current rate for calculations
Questions should be asked based on provisions relating to current assessment year.

References :

1. Income tax Law and Accounts :Dr.H.C.Mehrotra and S.P.Goyal
2. Income tax Law and Practice :Dr.Bhagavathi Prasad.
3. Income tax Law and Practice : Gaur and Narang
4. Income tax Law and Practice :B.S.Raman.
5. Direct taxes Law and Practice : Dr.Vinod K. Singhania&Dr.KapilSinghania

Marks including choice:

Unit	Marks
I	6
II	10
III	18
IV	14
V	8
Total	56

CORE COURSE IX: COST ACCOUNTING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B09 COM	5	4	3

COURSE OUTCOME

After studying this course, students shall be able to:

CO 1: Explain the nature, scope, objectives and limitations of costing
CO 2: Identify the elements of cost and describe the methods of their ascertainment and control
CO 3: Explain the various methods of costing and their suitability for different industries
CO 4: Ascertain the cost of production of products and jobs

Unit I:

Introduction to Cost Accounting – concepts, objectives and advantages – Financial Accounting and Cost Accounting –Elements of cost and cost classification – cost centre and cost unit- methods of costing - preparation of cost sheet

(10 Hrs)

Unit II:

Materials :- Concepts- centralized buying - purchase procedure– Store records – Bin card and stores ledger - methods of material issue pricing (FIFO, LIFO, Simple and weighted averages), stock levels, EOQ, ABC Analysis, VED Analysis – Essentials steps for material control

(15 Hrs)

Unit III:

Labour: - Concepts - Time keeping. Time booking- Wage system -Time rate, Piece rate, Taylor's differential piece rate system - Incentive system of wage payment -Halsey and Rowan Plan – Treatment of idle time - overtime – Labour turnover meaning and causes (theory only)

(15 Hrs)

Unit IV:

Over heads: - Concepts- classification, Allocation and apportionment -Direct, Simultaneous equation, Step ladder and Repeated distribution method- Absorption of overheads -Labour hour rate method and machine hour rate method – calculation of machine hour - Under and over absorption of overheads (meaning only)

(20 Hrs)

Unit V:

Methods of Costing –Job costing, batch costing, unit costing, Process costing: features – typical process industries - process accounts- normal loss and scrap- abnormal loss and gain – Explanation on Joint products and by products – Contract costing: Special features- Cost plus contract- Escalation clause- Sub contract- Retention money- Treatment of cost of plant – Profit on incomplete contract.

(30 Hrs)

Books for Reference:

1. Cost Accounting principles and Practice :Iyengar . S.P
2. Cost Accounting :S.P.Jain& K.L. Narang
3. Management Accounting :Dr.S.P.Gupta
4. Management Accounting :R.K.Sharma&S.K.Gupta
5. Cost Accounting :JawaharLal.
6. Cost Accounting :Dr. A.D. Agarwal
7. Practical Cost Accounting :Dr. A.D. Agarwal
8. Lectures on Costing :Swaminathan

Marks including choice:

Unit	Marks
I	8
II	10
III	10
IV	12
V	16
Total	56

CORE COURSE X : BANKING PRINCIPLES AND OPERATIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B10 COM	5	4	3

COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: Explain banking and describe the different types of banks and the functions of commercial bank
CO 2: Narrate the role of RBI in the credit control, promotion and regulation of monitory system
CO 3: Describe the relations ship between banker and customer and the procedure for opening and operating the account
CO 4 : Understand the modern trends and technology used in banking

Unit I :
Introduction to Banking – meaning – features –commercial banks and their functions – Classification of banks in India – List of Nationalised banks in India – Scheduled banks – New generation Private sector banks – Co operative Banks in Kerala – meaning – features – structure and importance – Role of Banks in economic development.

(20 Hrs)

Unit II :
Reserve Bank of India – Functions – Credit control measures – quantitative and qualitative methods- Promotional and Regulatory measures – Repo - Reverse Repo.

(15 Hour)

Unit III:
Banker and Customer – General relationship and Special Relationship – Opening and Closing of Bank accounts – KYC norms - Cheques – features – crossing – types- endorsement – types – banking ombudsman

20 Hours)

Unit IV:
Loans and advances – Principles of sound Lending – Loan – Cash credit – Overdraft – Consortium advances – Modes of creating charges – Lien - pledge – Hypothecation – mortgage and guarantee

(15 Hrs)

Unit V:
Recent trends and Technology in Banking – Need and importance – Online/ internet Banking – Mobile application banking – Core banking – RTGS – NEFT - IMPS -MCLR – IBC – MSME- TReDS -– BASEL NORMS – NPA monitoring and recovery-– Digital banking – Payment Gateways – Supply chain finance – Retail lending – Sale of third party products – Sarfaesi —Direct benefit transfer .(a brief outline of all the terminologies)

(20 Hours)

References:

1. Bankig theory and practice- K C Shekar
2. A text book of Banking – M Radhaswami and S V Vasudevan
3 Banking law and practice – Maheswari
4. Banking and Financial system- Vasant Desai
5. Modern Banking – K P M Sundaram and E N Sundaram

Marks including choice:

Unit	Marks
I	12
II	10
III	12
IV	12
V	10
Total	56

CORE COURSE XII : FINANCIAL MARKETS AND SERVICES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B12 COM	4	3	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the financial system and its constituents
CO2: familiarise with the activities taking place in the financial markets
CO 3: Appraise the various financial services available in the financial markets
CO 4: acquire knowledge about financial derivatives and their features

Unit I

Indian financial system: Financial system, meaning, structure—financial markets- financial institutions- financial instruments – financial services- Role of financial system in economic development –Financial markets and instruments

[10 Hours]

Unit II

Money market –Meaning – features- functions or importance- components – Call money market – commercial bill market- acceptance market – treasury bill markt- Money market instruments- Treasury bill-Commercial bills – Commercial papers – Certificate of Deposits

[12 Hours]

Unit III

Capital Market- Meaning –Primary Market, methods of floating new issue, - Secondary market - Stock exchange- Functions- listing of securities-Dematerialization and Depository services

[15 Hours]

Unit IV

Financial Services – meaning – nature and scope – Types - Merchant banking – Meaning, objectives and functions- Mutual funds – Meaning, objectives and types of schemes - Credit rating –Meaning, functions and major agencies (CRISIL,ICRA,CARE)- Factoring- Meaning, objectives and mechanism - Venture Capital –meaning, features, funding pattern

[22 Hours]

Unit V

Financial Derivatives - meaning- definition- types- forwards- futures- options – swaps- types and features, advantages and limitations of financial derivatives (An overview of financial derivatives only)

(13 Hours)

Reference:

1. Financial Institutions &Markets : L.M. Bhole.
2. Marketing of Financial Services : V.A Avdhani.
3. Investment Management : V.K Bhalla.
4. Indian Financial System :Vasant Desai
5. A profile of Indian Capital Market :Vinayakan.
6. Financial Markets and Services: E. Gordon and K. Natarajan
7. Financial Markets, Institutions &Services : N.K Gupta & Monika Chopra Hours]
8. Futures And Other Derivatives: Hull John

Marks including choice:

Unit	Marks
I	8
II	12
III	12
IV	16
V	8
Total	56

CORE COURSE XIII : MANAGEMENT ACCOUNTING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B13 COM	5	4	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1. understand the fundamental concepts of management accounting.
CO 2. acquire analytical skills associated with the interpretation of accounting reports
CO 3. apply management accounting concepts in real life situations.
CO 4. develop judgmental skills associated with the use of accounting information in decision making.
CO 5. understand the use of marginal costing and budgetary control to plan and control cost and profit.

Unit I:

Introduction to Management Accounting: Meaning- Definitions, Objectives, Uses-Scope of Management Accounting – Management Accounting Vs Financial Accounting - Management Accounting Vs Cost Accounting.

(8 Hrs)

Unit II:

Analysis and interpretations of financial statements: Financial Statements – meaning, nature and limitations - Financial Statement Analysis – concept and meaning – types – tools of financial analysis - Comparative Financial statements, Common- size Financial statements, Trend analysis - Ratio analysis – concepts, definition, advantages, limitations-Types of ratios- Liquidity Ratios, Solvency Ratios, Activity Ratios, Profitability Ratios and Market test Ratios – computations and interpretations. (Construction of final accounts are not expected)

(32 Hrs)

Unit III:

Cash flow statements: meaning, concepts, definitions and uses - Preparation of Cash Flow Statement in both Direct and Indirect Methods (in vertical form as per AS 3).

(20 Hrs)

Unit IV:

Marginal Costing: meaning, objectives and features- contribution - CVP Analysis- BEP Analysis -Computation of BEP and sales to earn a desired level of profit - P/V Ratio-computation - managerial uses of Marginal Costing (Profit planning, Fixation of price, Make or buy decisions & Problem of key factor/limiting factor only)

(20 Hrs)

Unit V:

Budgetary control: Concepts, Objectives and classification of budgets- Preparation of Cash, Sales and Flexible Budgets.

(10 Hrs)

Reference:

1. Management Accounting : Sharma R.K & Sasi K Guptha
2. Management Accounting : N.M Singhvi & Bodhan Wale
3. Management Accounting : RSN Pillai & Bhagavathi
4. Management Accounts : S N. Maheswari
5. Management Accounts : S.P. Guptha

Marks including choice:

Unit	Marks
I	6
II	18
III	12
IV	12
V	8
Total	56

CORE COURSE XIV: AUDITING AND CORPORATE GOVERNANCE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B14 COM	5	4	3

COURSE OUTCOME

After studying the course, the student shall be able to;

CO 1: understand the term auditing, its concept, principles, procedures and requirements needed for Auditing in accordance with current legal requirements and professional standards.

CO 2: familiarize with the various aspects of audit consisting of internal check, vouching, verification and valuation of assets and liabilities

CO 3: understand the appointment, rights, duties and the liabilities of an auditor.

CO 4: explain the concept of Corporate Governance and its aspects

Unit I

Introduction – Meaning- Definition- Objectives - Concept of auditor's independence- Types of audit– statutory audit–private audit- government audit - continuous audit– final audit – interim audit - cost audit – management audit – tax audit – Social audit - performance audit –Internal audit - Investigation**;** Meaning of Investigation- Distinction between investigation and auditing.

(20 Hrs)

Unit II

Audit Process -- Documentation **-** Preparation before audit-Audit Programme-Audit Note Book-Audit Working Papers-Audit Files- Internal Control and Internal Check–Principles of Internal check.

(15 Hrs)

Unit III

Vouching and Verification **-** Vouching - meaning and importance- Requirements ofa voucher -Vouching of various items (Cashbook – Credit purchase- credit sales- goods sent on consignment- journal proper- outstanding assets & liabilities- capital and revenue expenditures only) Verification – meaning-Difference between vouching and verification- general principles for verifying assets-Valuation of assets;Difference between verification and Valuation- Verification and valuation of Assets (Cash at bank, Loan advanced, Debtors, Stock, Plant & Machinery, patents, Goodwill, Motor vehicles only) --Verification and valuation of Liabilities (Creditors, Loans, Debentures, Capital, Contingent liability only)

(25 hrs)

Unit IV

Audit of Limited Companies- appointment- **-**Qualifications and Disqualifications of an Auditor- Auditor's remuneration- Auditor's lien- Removal of an auditor- Rights, Powers and Duties of an Auditor -Liabilities of an Auditor – Auditor's Report – content- types

(20 Hrs)

Unit V:
Conceptual Framework of Corporate Governance: Meaning, Benefits of Corporate Governance; board committee and their functions- insider Trading - Green Governance/E-governance.

(10 Hrs)

References:

1. Bhatia R.C. *Auditing,* Vikas Publishing House, New Delhi.
2. DinkarPagare .*Auditing*, Sultan Chand & Sons New Delhi.
3. JagadeeshPrakash . Auditing*: Principles and Practices*, Chaitanya Publishing House, Allahabad.
4. Kamal Gupta. *Contemporary Auditing*, Tata McGraw-Hill Publishing Co.Ltd. New Delhi.
5. Saxena and Saravanavel .*Practical Auditing*, Himalaya Publishing House, Mumbai.
6. Sharma R. *Auditing*, Lakshmi NarainAgarwal, Agra.
7. Sharma T.R. *Auditing*, SahityanBhawan Publications, Agra.
8. Tandon B.N. *Practical Auditing*,S Chand &Co.Ltd. New Delhi.
9. Mallin, Christine A. Corporate Governance, Oxford University Press, New delhi
10. Rani, Geeta D and R.K. Mishra, Corporate Governance- Theory and Practice, Excel Books New Delhi

Marks including choice:

Unit	Marks
I	10
II	13
III	12
IV	13
V	8
Total	56

CORE COURSE XV: INCOME TAX AND GST

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B15 COM	5	4	3

COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: Compute total income and determine the tax liability of an individual and partnership firm, company and cooperative society
CO 2: Describe the income tax authorities, their powers and assessment procedure
CO 3: Explain the procedure regarding deduction of tax at source, advance tax, refund, penalties and prosecution
CO 4: Describe Goods and Service Tax, its levy and collection

Unit I

Clubbing of Income – provisions – deemed income – aggregation of income – set off and carry forward of losses –Computation of Gross total Income - Deduction from gross total income Computation of total income –

(20 Hours)

Unit II

Assessment of individuals - computation of tax – assessment of partnership firms – computation of tax - assessment of Co-operative Societies – Computation of total income and tax liability

(25 Hours)

Unit III

Income Tax Authorities and their powers – CBDT – Powers and functions – Commissioner of income tax – powers and functions – income tax officers. Assessment procedure – types of return – procedure for filing return – e filing- PAN – types of assessments – rectification of mistakes

(10 Hours)

Unit IV

Deduction of Tax at Source – items of income from which tax is deducted at source – collection of tax at source - Advance payment of tax – refund of tax – Penalties and prosecution –provisions .

(20 Hours)

Unit V

Goods and Services Tax**:** Brief history behind the emergence of GST – The scope of GST –Definitions and meaning - Central Goods and Services Tax Act–Integrated Goods and Services Tax Act - State Goods and Services Tax Act - Levy and Collection of Central/State Goods and Services Tax - Taxable person - Power to grant exemption from tax - Time and value of supply of goods - Time of supply of services

(15 Hours)

Note : Questions should be asked based on provisions year relating to current assessment year.

Consider the Current rate for calculations

References :

1. Income tax Law and Accounts :Dr.H.C.Mehrotra and V.P.Goyal
2. Income tax Law and Practice :Dr.Bhagavathi Prasad.
3. Income tax Law and Practice : Gaur and Narang
4. Income tax Law and Practice :B.S.Raman.
5. Direct taxes Law and Practice : Dr.Vinod K. Singhania&Dr.KapilSinghania
6. Goods and Service Tax, Dr. H C Mehrotra and Prof. V.P.Goyal

Marks including choice:

Unit	Marks
I	18
II	14
III	8
IV	8
V	8
Total	56

CORE COURSE XVII: PROJECT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B17 COM	2	2	-

COURSE OUTCOME

CO 1: understand the method of carrying out a project
CO2: undertake project work independently

Guidelines for Project

1. During the sixth semester every student shall do a project .The student may choose any topic from the subjects he/she has studied.
2. The candidate shall prepare and submit a project report to the Department.
3. The report shall be in English with not less than 30 pages, printed or typed (A4 size paper, 1.5 line spacing, Times New Roman font, font size 14) and spiral bound.
4. The project report should be submitted to the Head of the Department one week before the last working day of the sixth semester, duly certified by the Guide.
5. The project can be done individually or as a group of four students (maximum) on the same topic and present the report. However, the project supervisor should make sure that each student constructively contributes to the completion of the project.
6. The work of each student shall be guided by one Faculty member.
7. The candidate shall prepare at least two copies of the report; one copy for submission to the Department and another copy for the student, which he/she has to bring with him/her at the time of viva voce.
8. Duration of project work -The duration for project work is 3 weeks.
9. A certificate showing the duration of the project work shall be obtained from the supervising teacher or from the organization for which the project work was done and it should be included in the project report.
10. Structure of the report

a) Title page
b) Certificate from the supervising teacher / organization (for having done the project work)
c) Acknowledgements
d) Contents
e) Chapter I: Introduction (Organization profile, Research problem, Objectives of the study, Research methodology etc.)
f) Chapter II : Review of Literature
g) Chapters III and IV: Data Analysis (2 or 3 chapters)
h)Chapter V : Findings, Suggestions and Conclusion.
i) Appendix : (Questionnaire, specimen copies of forms, other exhibits etc.)
j) Bibliography: (books, journal articles etc. used for the project work).

Evaluation of project report

The project report shall be subject to internal and external evaluation. The internal evaluation shall be carried out by the supervising teacher and external evaluation done by the external examiners appointed by the University

1. Evaluation of the Project Report shall be done under Mark System. Total mark for the project will be 50. Marks secured for the project will be awarded to candidates, combining the internal and external marks
2. The internal to external components is to be taken in the ratio 1:4.

Assessment of different components may be taken as below.

Internal (20% of total)		External (80% of total)	
Components	% of marks	Components	% of marks
Punctuality	20	Relevance of the topic, statement of objectives, methodology, reference/ bibliography	20
Use of data	20	Presentation, quality of analysis/use of statistical tools, findings and recommendations	30
Scheme/ organisation of project report	30	Project Viva-Voce	50
Project Viva-Voce	30		
	100		100

3. There shall be no improvement chance for the marks obtained in the Project Report.

CORE COURSES IN THE ELECTIVE STREAM

ELECTIVE STREAM I – CO-OPERATION

CORE COURSE IV : CO-OPERATION I – CO-OPERATIVE PRINCIPLES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B04 COM	5	4	3

After studying this course, students shall be able to;

CO 1: Understand the concepts and principles of Cooperative movement
CO2: Understand the origin of cooperative movement and the history of cooperatives in the world
CO 3: Describe Indian cooperative movement, its features , structure and significance
CO 4: Acquaint themselves with the system of cooperative education, training and its impact on the functioning of cooperative organisations

Unit I : Philosophy and genesis of co-operative movement - Definition and meaning of Cooperation – ICA definition-characteristics. Evolution of co-operative principles – Rochdale principles- Reformulated principles of 1966- Redefined principles of 1995 – Application of the principles. Co-operatives as economic enterprises – its importance – differences between other forms of organizations and cooperative enterprise. Cooperation and other economic systems-Capitalism, socialism and communism. Importance of Cooperative organisations in the economic development.

[20 Hours]

Unit II : Co-operative movements in Foreign countries Origin of co-operative movement in England – Experiments of Robert Owen (Doctrine of circumstances – Friendly societies – Labour colonies – Labour exchanges) – Rochdale pioneers – C.W.S.S, -Credit cooperatives in Germany –Raiffiesen and Schulze movement –Dairy and poultry co-operatives in Denmark – M.P.C.S in Japan –industrial co-operatives in China – collective farms in U.S.S.R. Marketing co-operatives in U.S.A – Consumer societies in Sweden.

[25 Hours]

Unit III: Co-operation in India – Early experiments –Frederic Nicholson's Report- Maclegan committee on cooperation –Co-operative planning Committee 1945 – All India Rural Credit Survey Committee –All India Rural Credit Review Committee – CRAFICARD – Kapoor Committee. Co-operatives in Kerala (an overview of various kinds of cooperative organisations functioning in Kerala)

[20 Hours]

Unit IV: Rural credit – classification of credit based on period, purpose and security-structure of co-operative credit- three tier and two tier credit –Multi agency approach to rural credit- Institutional agencies providing rural credit. NCDE, NHB, NABARD, etc; National Rural Credit Stabilisation Fund and National Rural Credit (L.T.O) Fund. Constitution and working of N.C.D.C – Role of N.C.D.C in the development of co-operatives.

[10 Hours]

Unit V :Co-operative education and training – objectives and significance – International cooperative Alliance –Role - National Co-operative Union of India – constitution and working – NCCT-NCCE-VAMNICOM- ICM.Structural arrangement for training –co-operative training centres- co-operative training colleges- member education units – other functions. Publicity and propaganda –journal – cooperative week celebrations-co-operative flag
CAPE-ACSTI-KICMA.

[15 Hours]

Reference:

1. Theory and Practice of Co-operation in India : Kulkarni
2. Co-operative Movement in India : J. Banerjee
3. Co-operative Movement in India : F.M Hough
4. Co-operation –Principles and Practice : T.N Hajela
5. All India Rural Credit Survey Report
6. Co-operation in India : Dr. M.S Mathur
7. Theory, History and Practice of Co-operation : R.D Bedi
8. Co-operation at Home and Abroad : C.R Fay
9. Co-operation in Foreign Countries :Rajagopalan
10. Co-operation in India and Abroad : K.P Bhatnagar

Marks including choice:

Unit	Marks
I	13
II	13
III	12
IV	8
V	10
Total	56

CORE COURSE VI : CO-OPERATION II – MANAGEMENT OF CO-OPERATIVES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B06 COM	5	4	3

COURSE OUTCOME

After studying this course, students shall be able to;
CO 1: Understand kinds of cooperatives in India
CO 2: Understand the management and administration of different types of cooperatives
CO 3: Identify the role and significance of cooperative organization in Kerala's Economy
CO 4: Describe various kinds of cooperative institutions

Unit I: Credit Cooperative Societies – Meaning-features – significance-Primary Agricultural Credit Societies(PACS) definition –membership-constitution, objectives and working- differences between Primary Agricultural Credit Societies and Farmers Service co-operative Societies – crop loan system – linking of credit with marketing –kissan credit card –procedure to sanction loans –role of PACS in rural development–Central co-operative banks – membership- objectives-constitution of board of management – problems – over dues- suggestions for improvement. Kerala State co-operative Bank – origin- membership constitution- objectives- constitution of board of management – problems and suggestions for improvement.

[20 Hours]

Unit II: Long term credit –Agricultural and rural development – need for separate institutions -debentures - Debenture Redemption Fund- Primary co-operative agricultural and rural development bank- constitution, objectives and working – Kerala State Co-operative Agricultural and Rural Development Bank -membership- constitution of board of management – objectives and working problems and suggestions for improvement. Procedure in granting loans- over dues in long term credit societies –NPA.

[15 Hours]

Unit III: Non Agricultural credit societies – Primary co-operative urban banks-membership constitution, objectives and working (in brief)- Employees credit societies – membership –constitution, objectives and working (in brief)- Co-operative housing societies – importance and advantages – types of housing societies – HOUSEFED – constitution and working (in brief) – sources of funds – problems.

[15 Hours]

Unit IV: Marketing and Processing Societies – meaning of co-operative marketing – need,and importance –types of marketing societies Structure of cooperative marketing - primary marketing societies –- Kerala State Co-operative Marketing Federation Ltd.- NAFED- Processing co-operatives – meaning and importance-. Consumer co-operatives – Origin and importance of consumer co-operatives – structure-primary co-operative consumer stores –Kerala State Co-operative Consumers' Federation - National Co-operative Consumers Federation- role of consumer co-operatives in holding the price line.

(20 Hours)

Unit V: Industrial co-operatives –Meaning –features- Types- handloom societies – Structure-, objectives and working- Primary handloom weaver's co-operative societies, HANTEX- Coir co-operatives – types-objects and working- primary coir societies and COIRFED- Dairy co-operatives - Anand pattern objects and working primary milk producer's co- operative society- Regional co- operative milk producer's union – MILMA-NDDB- problems of dairy co-operatives – khadi and village industrial societies –SC/ST societies –NSFDC –Fisheries societies- MATSYAFED, Federation of women co-operative societies – Labour contract cooperatives –Farming societies –Motor transport cooperatives-Co-operative printing press- Dinesh Beedi –RAIDCO-SPCS-CAMPCO-RUBCO-IFFCO,KRIBHCO.(Brief outline only)

[20 Hours]

Books for Reference:

1. Theory and practice of co-operation in India : Kulkarni
2. Co-operative Movement in India : J. Banerjee
3. Co-operation Principles and Practice : T.S Balan
4. Co-operation principles and practice : T.N Hajela
5. Co-operation in India : Dr. M.S Mathur
6. Theory, history and practice of co-operation : R.D Bedi
7. Madras co-operative Manual co-operativemovement in India : Vol. I, II and III : J.C Rajan
8. Co-operation at home and abroad : C.R Fay
9. Co-operation in foreign countries :Rajagopalan
10. Co-operation in India and abroad : K.P Bhatnagar.

<u>Marks including choice</u>:

Unit	Marks
I	13
II	10
III	8
IV	13
V	12
Total	56

CORE COURSE XI : CO-OPERATION III – CO-OPERATIVE LAWS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B11 COM	4	4	3

COURSE OUTCOME

After studying the course, the students shall be able to:

CO 1: Understand the historical perspective of cooperative legislation in India and Kerala.
CO2: Understand the provisions of Kerala cooperative Societies Act 1969
CO 3: Describe the procedure for the formation and registration of a cooperative organisation
CO 4: describe the provisions of management and winding up of cooperative societies

Unit I

History of co-operative legislation in India Co-operative Credit Societies Act 1904 – features-limitations- Co-operative Societies Act 1912- features-difference between 1904 Act and 1912 Act- Multi- State Co-operative Societies Act 2002 –features-(Broad features only)

[15 Hours]

Unit II

Kerala Co-operative Societies Act and Rules 1969 – Historical back ground-Definitions –Registration of co-operative societies –Byelaws –contents- Amendment-Amalgamation and division of societies- Membership- Rights, duties and liabilities –Withdrawal and expulsion.

[12 Hours]

Unit III

Management of co-operatives – general body –Managing committee- powers and duties-adhoc committee-disqualification of committee members- Election of committee members- supersession of committee. Election of president –powers and duties-Secretary-duties and responsibilities-–Privileges of societies- State aid to co-operatives. Appointment of employees - Co-operative Service Examination Board.- Investment of funds-Disposal of net profit.

[15 Hours]

Unit IV

Meetings –Types- Annual general body meeting- special meetings. Requisites of a valid meeting – agenda - quorum- notice- minutes- duties of secretary .

[10 Hours]

Unit V

Inquiry and Winding up of societies –Inquiry – supervision and inspection-surcharge-winding up of societies- liquidator- powers- cancellation of registration .

[20 Hours]

References:

1. Kerala Co. op. Societies Act and Rules : Pillai
2. Kerala Co.op Societies Act and Rules : T.S Balan
3. Law for the Co.operatives : R.O Bedi
4. Law and Management of Co. operatives : Trivedi. BB
5. Co.operative Act and Rules : N.A Kareem
6. Co.operative Societies Act and Rules :Thankappan
7. Bare Act
8. Cooperative democracy in Action : O.R Krishnswami
9. Legal aspects of co-operation : P.M Natesan,N.JShaji, &V.S Anilkumar.

Marks including choice:

Unit	Marks
1	12
2	13
3	13
4	10
5	8
Total	56

CORE COURSE XVI : CO-OPERATION IV – CO-OPERATIVE ACCOUNTING AND LEGISLATIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B16 COM	4	4	3

COURSE OUTCOME

After studying the course, student should be able to;

CO 1: prepare and present accounting aspects of cooperative organisations
CO 2: understand the procedure of cooperative auditing
CO 3: Understand the provisions regarding the settlement of disputes in cooperatives
CO 4: Acquaint knowledge on the impact of various other legislations on cooperatives

Unit I: Co-operative Accounting – Features- Day book- types-R &D – differences between R & D and Trial balance-Profit and loss account – Balance sheet.

[20 Hours]

Unit II: Books and Registers to be maintained by co-operative societies- Audit of co-operative societies–special features of cooperative audit-difference between cooperative audit and Company audit- Director of Co-operative Audit – scope of audit- procedure-audit memorandum- audit fee and exemptions-

[13 Hours]

Unit III: Disputes and their settlement – Disputes- meaning- Arbitration-co-operative Arbitration court-powers-Award on dispute- procedure for the settlement of disputes-co-operative Tribunal.- Appeal-revision- review.

[13 Hours]

Unit IV: Co-operative unions – meaning- types- circle cooperative union, state cooperative union, NCUI- objectives- constitution- functions .

[10 Hours]

Unit V: Other Laws :(important provisions only)Indian Penal code – offence – misappropriation- criminal breach of trust – Forgery .Code of civil procedure – service of summons – properties not liable to attachment-writ– injunction- appeal, revision and review. Indian Evidence Act – oral and documentary evidence - primary and secondary evidence – Kerala Chitties Act- Industrial disputes Act – strike- layoff- lockout. A brief outline of Right to Information Act.

[16 Hours]

Reference:

1. Cooperative Societies Laws in Kerala : P.N Mohanan
2. Kerala Co.op Societies Act and Rules : T.S Balan
3. Law for the Co.operatives : R.O Bedi
4. Law and Management of Co. operatives : Trivedi. BB
5. Co.operative Act and Rules : N.A Kareem
6. The Co.operative Societies Act and Rules ,1969 : E.O Thankappan
7. Advanced Accountancy-Vol. I : S.P Jain & K.L Narang

Marks including choice:

Unit	Marks
I	13
II	10
III	10
IV	11
V	12
Total	56

ELECTIVE STREAM II – COMPUTER APPLICATION

CORE COURSE IV : COMPUTER APPLICATION I – INTRODUCTION TO COMPUTERS AND NETWORKS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B04 COM	5(3+2) (T+P)	4	2 hrs (theory) 1 hr (practical

COURSE OUTCOME

After studying the course, the students shall be able to;
CO 1: Understand about computer, peripherals, software and operating system
CO 2:Understand the importance of IT in the modern world and recent development in IT
CO 3: Develop WebPages for business

Unit I:

Introduction to Computer – meaning- definition -types of computers- components-Hardware and Software: Input, Processing, Storage, Output and Communication Hardware–Software: System Software and Application Software – Memory, types - Operating System: WINDOWS, UNIX and LINUX, Versions - Free Software Movement.

[10 Hours]

Unit II:

Network and Communications - Computer Networks – Types of Networks: WAN, MAN, LAN, PAN, CAN - Benefits of Networks - Network Topology –Work Group Computing & Groupware - Telecommuting & Virtual Offices - Network Security – Firewalls - Communication Medium: Wired and Wireless – Generations in Communication.

[15 Hours]

Unit III:

Internet -Working Concepts -Devices, Benefits and Drawbacks - Internet Structure, InternetProtocols: TCP/IP, FTP, HTTP, etc. - IP Address - Domain Name System (DNS) – URL - Web Browsers - WWW Consortium - Search Engines: Types - Academic Search Techniques - Internet Access Methods - Intranet and Extranet. [15 Hours]

Unit IV:

Recent Developments in IT- Virtualisation- Meaning, Types, Uses/Applications - Grid Computing- Meaning, Types, Uses - Cloud Computing- Meaning, Features, Advantages - Green Computing, Web 3.0, Internet of Things(IoT), Artificial Intelligence, Machine Learning, Big Data and Data Analytics (Brief outline only)

[15 Hours]

Unit V:

Basic Web Page Development: HTML Basics- creating HTML document, Building a Web Page-Text and Image formatting-Adding links, Web Development Tools - HTML Table Structure-Basic HTML table tags-Formatting the table, Multimedia Files on a Web Page, Using a Form-Creating formatted lists, Using Frames in a Web Page- structure of HTML document- tags &attributes- Syntax of Tag- Starting and ending tag- tag without end- <Head><Body> text basics- division and paragraphs- heading- physical styles tags- action attributes- lists- <OI>,<UL> and nested list- image tag- attributes <Forms>- <input> tags- controls- text boxes- check boxes- radio buttons- option buttons- submission and reset buttons.

[35 Hours]

Theory: 3 Hours/ Week
Practical: 2 Hours / Week

Recommended practical: HTML

1. Create websites for an automobile Company/an FMCG Company/an educational institution
2. Create an online application form for admission process / job application

References:

1. Alexis Leon & Mathews Leon: Fundamentals of Information Technology, Vikas Publishing House, New Delhi.
2. Williams &Sawyer: Using Information Technology (6th Edition), Tata McGraw Hill Company.
3. Uyless Black: Computer Networks, Protocols, Standards and Interface, Prentice Hall India Pvt. Ltd.
4. Mary Millhollon: Easy Web Design, PHI, New Delhi.
5. Nick Vandome: Creating Web Pages, DreamtechPublishers,New Delhi.
6. Mike McGrath: HTML in Easy Steps, Dreamtech Publishers, New Delhi.

Marks Including Choice

Unit	Marks
I	6
II	8
III	6
IV	6
V	6
Total	32

Maximum mark for theory : 20
Maximum mark for practical : 20

CORE COURSE VI : COMPUTER APPLICATION II – DATA BASE MANAGEMENT SYSTEM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B06 COM	5(3+2) (T+P)	4	2 hrs (Theory) 1 hr(Practical

COURSE OUTCOME

After studying the course, the students shall be able to:
CO 1: familiarize with the concepts of database management
CO 2: handle the database for business firms.
CO 3: develop knowledge in Access and SOL

Unit I:

Database Concepts: Meaning-Definition - Necessity of a database - Characteristics ofdatabase – Character- Field – Record – File-Database- Types of Databases- Entities,Attributes, Keys – DBMS - Advantages of Database Systems –Components of DBMS- Database Structure – Popular Database Softwares (Brief outline only)-Types of DBMS-RDBMS-The NoSQL DBMS- IMDBMS.

[12 Hours]

Unit II:

RDBMS & Relationships in Database : Data Models - Relational Data Model - RDBMS – Relationships- Types of Relationships - One to One - One to Many - Many to Many – Functional Dependency -Normalization : Meaning , Schemas (1NF, 2NF, 3NF)- Defining Relationships -Referential Integrity Key: Candidate key , Primary key, Foreign Key.

[10 Hours]

Unit III:

Database Administration – Meaning, Advantages – Data Warehousing- Meaning, importance, Methods Integrating Heterogeneous Databases-Query-driven Approach, Update-driven Approach -Data Warehouse Features-Data Warehouse Applications-Types of Data Warehouse-Data Mining – Meaning, Process.

[13 Hours]

Unit IV:

Introduction to Database Software- MS Access 2013 : Introduction - Objects in MS Access - Create, Open, and Close a Database - Creating a Data Table - Different ways of Creating Tables - Data Types - The Primary Key - Properties of the Fields - Saving a Table - Closing a Table - Modifying Data Tables - Creating Table Relationships -Editing Relationships. Queries & Forms in Access: Types of Queries - Creating a Query - Saving Queries -Summary Queries - Cross Tab Queries - Action Queries - Forms - The Form Wizard - Editing the Data in a Form - The Form Design View - The Form Design Bar -

The Toolbox - Working with Controls. Reports in Access: The Report Wizard - The Report Design View - The Report Design Bar - The Toolbox - The Preview Window - Grouping and Sorting - Printing a Report.

[30 Hours]

Unit V:

SQL – Data Definition Language – Data Manipulation Language - statements – Creating tables, Selecting Data, Updating Records, Dropping a table, Querying Database, Aggregating Data, Grouping, Ordering Data - Constraints,–Adding constraints, NOT NULL, UNIQUE, PRIMARY_KEY - Select statements- DISTINCT – WHERE Clause-conditions based on a range – BETWEEN – Conditions based onpattern matches – LIKE – Aggregate – functions – AVG – sum count – MAX – MIN- group by – order by.

[25 Hours]

Theory: 3 Hours/ Week

Practical: 2 Hours / Week

Recommended practical: MS Access 2013 and SQL (Keep Practical Records)

Creating and Modifying Data base - Creating Relationship between Tables – Using Queries for Viewing and Modifying Data from Tables -Working with Forms - Managing Controls in Forms -Generating Reports.

References:

1. C.J. Date, A.Kannan&S.Swamynathan: An Introduction to Database Systems, Pearson Education
2. Elmasri,,Ramez and Navathe: Fundamentals of Database Systems.
3. Ritchie & Collin: Principles of database systems and Design.
4. Viescas, John L and Conrad Jeff , Microsoft Office Access 2013 Inside Out.
5. Michael Alexander, Richard Kusleika: Access 2013 Bible, Wiley Books.
6. Joan Lambert & Joyce Cox, Microsoft Access 2013 Step by step,
7. Connolly, Thomas and Begg, Carolynn , Learning SQL A step-by-step guide.

Marks Including Choice

Unit	Marks
I	6
II	7
III	6
IV	7
V	6
Total	32

Maximum mark for theory 20

Maximum mark for practical 20

CORE COURSE XI : COMPUTER APPLICATION III – INFORMATION TECHNOLOGY FOR BUSINESS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B11 COM	4(2+2) (T+P)	4	2 hrs (Theory) 1 hr(Practical)

COURSE OUTCOME

After studying the course, the students shall be able to:

CO 1: Understand the role of information technology in business

CO 2: acquire knowledge in E-Commerce and its application

CO 3: acquire knowledge in information systems and Enterprise Resource Planning

CO 4: manage the office activities with the help of spreadsheet software

Unit I:

E-commerce- E-commerce, features, advantages,- difference between traditional commerce and E-commerce- components of E-commerce-B2B, B2C, C2C, C2B- process of E-commerce (work flow)- **E-governance**- laws governing E-commerce- IT Act 2000, companies act 2013, GST 2017, FEMA 1999, Consumer Protection Act (brief outline only)- **E-payment systems**– meaning, importance, advantages, types – UPI, IMPS, E-wallets, Aadhar enabled payment system, QR Code payment, NEFT, RTGS, Netbanking, Plastic money (brief outline only)

[15 Hours]

Unit II:

Business Information System- Information systems – meaning, components, business process- role of information system in business- types of information systems- Transaction Processing System, Office Automation System,Decision Support Systems, Knowledge Management System(brief outline only)- Management Information System- MIS Definition-Need-Benefits-Functions-Objectives-Characteristics-Role of MIS.

[15 Hours]

Unit III:

Enterprise Resource planning-Concept & definition, features, components, levels of ERP, Benefits of ERP, Modules of ERP, Phases of ERP implementation, Limitations of ERP - Customer relationship Management System (CRM)- Supply Chain Management system (SCM)- Human Resource Management system (HRMS)- accounting information system.

[10 Hours]

Unit IV:

Spreadsheet application for business- conditional formatting- charts& diagrams- Logical Functions: AND, OR,NOT, IF, IFNOT, COUNT, COUNTIF, TRUE- Text Functions: UPPER, LOWER, LEFT, RIGHT, TRIM, TEXT, LEN, DOLLAR, EXACT; Financial Functions: Depreciation (DB, DDB, VDB), Simple Interest (PMT, NPER, INTRATE) - Present Value, Net Present Value, Future Value (PV, NPV, FV) - Internal Rate of Return (IRR, MIRR)- Statistical Functions: Mean, Median, Mode, Standard Deviation, Correlation, Regression- Date & Time Functions: DATE, DATEVALUE, DAY, DAYS360, NOW, TIME, TIMEVALUE, WORKDAY, WEEKDAY, YEAR - Lookup and Reference Functions: HLOOKUP, VLOOKUP, TRANSPOSE, GETPIVOTDATA – PIVOT TABLE –HYPERLINK.

[32 Hours]

Theory: 2 Hours/ Week
Practical: 2 Hours / Week
Recommended practical: MS Excel

1. Conditional Cell Formatting
2. Analysis and presentation of data using charts in Excel
3. Usage of all Excel Functions in specified in syllabus
4. PIVOT TABLE, Regression

Reference:

1. James A O’brien, George.M.Marakas& Ramesh Behl, Management Information Systems,McGraw Hill Education,
2. D.P Goyal, Management Information Systems: Managerial Perspectives, Vikas Publishing House,
3. A.K Gupta, Management Information System, S.Chand& Company
4. Alexis Leon, Enterprise Resource Plannning, McGraw Hill Education
5. JyotindraZaveri, Enterprise Resource Planning, Himalaya Publishing House
6. Excel 2013 Bible: John Walkenbach, Wiley.
7. Microsoft Excel 2013: Data Analysis and Business Modeling: Winston, PHI
8. Financial Analysis and Modeling using Excel and VBA: ChandanSengupta, Wiley
9. Patrick Blattner, Louie Utrich. Ken Cook & Timothy Dyck, Special Edition Ms Excel,Prentice Hall India Pvt. Ltd.
10. Brealey.&.MyersIS: Financial.Analysis.With.Excel.-.McGraw.Hill.
11. www.excel-easy.com
12. www.excelmadeeasy.com

Marks Including Choice

Unit	Marks
I	7
II	9
III	8
IV	8
Total	32

Maximum mark for theory : 20
Maximum mark for practical : 20

CORE COURSE XVI : COMPUTE APPLICATION IV – ACCOUNTING PACKAGES - TALLY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B16 COM	4(2+2) (T+P)	4	2 hrs (Theory) 1 hr(Practical)

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: acquire knowledge in the accounting package Tally

CO 2: .understand the method of creating accounts and vouchers in tally.

CO 3: able to prepare financial statements by using Tally

CO 4: Help students develop skill in preparing financial statements in Tally.

CO 5: perform treatment of GST and TDS by using Tally

Unit I

Introduction to computerised accounting: Computerised accounting Vs. Manual accounting- Advantages and limitations of computerised accounting – Tally 9 - Features of Tally – Technological advantages of tally- Tally Screen components-Creation of Company- selecting a company – altering/ modifying company creation details – Deleting a company – F 11 Features – F 12 Configuration.

(16 hrs)

Unit II

Accounts and Vouchers – Account groups – pre-defined groups – creating single & multiple groups – creation of primary account groups – creating ledger accounts in single & multiple – displaying, altering and deleting account groups and ledgers – Accounting vouchers- pre defined vouchers in tally -entering transactions in accounting vouchers - altering and deleting a voucher entry — Account books -Bank reconciliation statement – Trial balance– Profit and loss account - Balance sheet - Cost categories- cost centers– creating-displaying, altering and deleting cost categories and cost centers--Budgets-Creation, alteration and deletion of budgets.

(20 hrs)

Unit III

Accounts with inventory – enabling F 11 and F 12 - stock category – stock group – single/multiple creation of stock category and stock group – creation of units of measurement – creating single/multiple stock items – creating - displaying, altering and deleting stock groups, unit of measure, stock items– inventory reports - stock summary.

(18 hrs)

Unit IV

Accounting with Tax – F 11 & F 12 settings for taxation – TDS - ledgers related to TDS – creating TDS voucher types - TDS reports – –GST – GST terminologies -Types of GST – computing GST – ledgers and vouchers pertaining to GST – Ledger Creation - Creation of CGST, Input SGST –Input IGST- GST reports.

(18 hrs)

Theory – 2 Hours / week.

Practical – 2 Hours / week. – Trial Balance, Profit & Loss A/c , Balance Sheet, Cost Centers, Bank reconciliation , Budgets , Stock item and unit of measure creation, TDS & GST

Record keeping is compulsory

References

1. Implementing Tally 9 A Comprehensive Guide to Tally 9- A.K. Nadhani & K.K. Nadhani - BPB Publications

Marks including choice

Unit	Marks
I	10
II	10
III	6
IV	6
Total	32

Maximum mark for theory 20

Maximum mark for practical 20

ELECTIVE STREAM III – FINANCE

CORE COURSE IV : FINANCE I – FINANCIAL MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B04 COM	5	4	3

COURSE OUTCOME

After studying the following chapters, the students shall be able to :

CO 1: understand the concept, importance and techniques of capital budgeting.
CO 2: gain knowledge about sources and uses of working capital and significance of working capital management.
CO 3**:** explain optimum capital structure, theories of capital structure, distinguish between financial and operating leverage.
CO 4: describe the concept of cost of capital and compute the component cost of capital and weighted average cost of capital.
CO 5**:** differentiate the types of dividend, explain dividend policy and factors affecting dividend policy

Unit I

Financial management- meaning- definition- objectives- time value of money- Economic evaluation of investment projects: Nature of investment decisions – investment evaluation criteria – payback period method -Average rate of return method- - NPV – IRR – capital rationing.

[25 Hours]

Unit II

Working capital management: Meaning, significance, factors and types of working capital –principles of working capital management- operating cycle method of estimating working capital.

[15 Hours]

Unit III

Capital structure: Optimum capital structure - Theories of capital structure – NI approach ;NOI approach- traditional theory- MM theory (Theoretical aspects only) Leverage: Meaning – Financial, Operating and Combined Leverage (Simple Problems only)

[20 Hours]

Unit IV

Cost of capital:– Meaning- significance – determination of cost of capital – computation of cost of individual components – cost of debt – preference capital –equity capital- retained earnings-Weighted average cost of capital.

[15 Hours]

Unit V

Dividend Decision – Dividend- Meaning – Types of Dividend - Dividend policy – conservative v/s liberal policy – factors determining dividend policy

[15 Hours]

References:

1. Financial Management : M.Y Khan & S.P. Jain
2. Financial Management : Dr. Prasannachandra
3. Financial Management : Ravi M. Kishore
4. Financial Management : Dr. S.N. Maheswari
5. Financial Management : I.M Pandey.
6. Financial Management : M.Y Khan & S.P. Jain
7. Financial Management : Dr. Prasannachandra
8. Financial Management : Ravi M. Kishore
9 Financial Management : Dr. S.N. Maheswari
10. Financial Management : P.V. Khulkarni
11. Financial Management : R.K Sharma &ShasiK.Guptha.

Marks including choice:

Unit	Marks
I	15
II	10
III	13
IV	10
V	8
Total	**56**

CORE COURSE VI : FINANCE II – INVESTMENT MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B06 COM	5	4	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the concept of investment and risk
CO2: explain the different types of securities and their schemes
CO 3: develop a thorough knowledge about security market, its participants and factors affecting security market
CO 4: conduct fundamental and technical analysis of investments in the security market
CO 5: discuss the application of Portfolio Theory, process of portfolio management and measurement of portfolio performance.

Unit I

Investment – Meaning, Definition- Need – Benefits –Investment alternatives-Investment attributes- Investment v/s speculation- arbitrage- hedging- Role of investment in Economic Development – Factors influencing investment- Different investment avenues – features – Return – Meaning – Types – Risk- Meaning – Sources of Risk.

[15 Hours]

Unit II

Securities: Different types of securities – Equity, Debt, Preference shares, money market instruments, Government securities, derivatives- types- Mutual funds: entities in mutual funds –types of schemes

[15 Hours]

Unit III

Securities Market: Participants-Primary Equity market- methods of raising equity-stock invest- book building-Secondary equity market- procedure for buying and selling securities, types of orders online trading, stock market indices BSE and NSE-Sensex and Nifty-

[20 Hours]

Unit IV:

Security Analysis: Fundamental analysis – Economic, industry and company analysis – Technical analysis – Tools- Charting techniques-(Basic concepts only)

[20 Hours]

Unit V

Portfolio Management Process: Meaning and types of portfolio – Scope and Objectives of Port Folio Management - Portfolio Management Process (Theory only)

[20 Hours]

Reference:

1. Investment Analysis & Portfolio Management :Prasanna Chandra, Tata McGraw Hill
2. Investment Management :Saram Harry , Prentice Hall
3. Portfolio Management : Francis &Aricher
4. Portfolio Management : S. Kevin
5. Security Analysis & Portfolio Management : PunithavathyPandyan, VikasPublishing House, Pvt. Ltd)

Marks including choice:

Unit	Marks
I	8
II	10
III	14
IV	12
V	12
Total	56

CORE COURSE XI : FINANCE III – GOODS AND SERVICE TAX

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B11 COM	4	4	3

COURSE OUTCOME

After studying the course, the students shall be able to,

CO 1: understand the basic concept of GST.
CO 2: Explain how GST is levied and collected.
CO 3: describe IGST, its levy and collection
CO 4: femiliarise with the preparation of invoice and filing of return under GST

Unit I:

Basic concepts-(Salient features , Benefits, GST Network, Taxes subsumed, Why GST)- Scope of Supply- important definitions supply analysis (basics)- Necessary elements that constitute supply under GST Act- Types of supply concept of supplier and recipient under GST Law - Goods under GST Act 2017 (over view)-Activities treated as supply of goods as Schedule ll of GST Act- Services under GST Act- Activities treated as supply of services as per Schedule ll of under GST Act

(15 Hours)

Unit ll:

Levy and collection - taxable event under GST- Concept of levy and collection of GST - Reverse charge mechanism (Basics)- composite supply, principal supply, mixed supply – composition levy and exemption - Provisions relating to composition scheme under GST Act, Rules required for opting composition scheme- conditions and restrictions for composition levy

(10 Hours)

Unit lll

Time of Supply- Goods- need to determine TOS- terms like supplier, Recipient, Reverse charge, Time limit for issue of invoice in respect of goods- section 12- services : section 13,13(1),13(2) Place of service - Goods - section 10(1) and 10(2) services -section 12(1) and 12(2) – problem- Questions

(16 Hours)

Unit lV

Integrated GST - IGST and taxable event - levy and collection (only section 5(1) excluding import) - interstate supplies and intra state supplies (Basic view) central Govt.,s power to grant exemption - Sections 6(1) , 6(2),6(3)- lnput tax credit- Concept of ITC - conditions to be satisfied for taking lrc - Registration - Persons liable for registration I section 22(1),(2),(3) and (a)] - persons not liable for registration(Section

23)- Compulsory registration (Section 24)Registration procedure in brief- Provision relating to cancellation of registration Section 29(1)

(15 Hours)

Unit V

Tax invoice and Return filing - Provisions and Rules relating to Dr and Cr note- Section 31(1),(2),(3),(4),(5)- Basic journal entries -Accounts and records- Problems questions (lnterstate and intra state) - Return filing - tax payment and refund (an over view) - Provisions relating to furnishing of returns (section 39(1)- Methods of tax payment section 49(1)- Refund basics section 54(1)

(16 Hours)

Books for Reference:

Beginners's guide to GST - Dr Vandana Bangra & Dr yogendra Bangara
Taxmann's GST ready reckoner
lndirect tax - Vineeth Sodhani
lndirect tax - Muhammed Rafi Syed

Marks including choice:

Unit	Marks
I	12
II	8
III	12
IV	12
V	12
Total	56

CORE COURSE XVI : FINANCE IV – CORPORATE TAX PLANNING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B16 COM	4	4	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the concept of tax planning and determine the tax liability of companies
CO 2: understand the methods of reducing tax liability through proper tax planning
CO 3: take financial and managerial decisions after considering the impact of direct tax laws

Unit I

Tax planning, Tax management, Tax evasion, Tax avoidance. Corporate tax in India - Types of companies - Residential status of companies and tax incidence - Tax liability and Minimum Alternate Tax- Tax on distributed profits.

[10 Hours]

Unit e II

Tax planning with reference to setting up of a new business: Locational aspect, nature of business, form of organization –simple problems sole proprietorship vs firm ,firm vs company Tax planning with reference to financial management decision -Capital structure, dividend including deemed dividend and bonus shares - Tax planning with reference to specificmanagement decisions -Make or buy; own or lease; repair or replace - Tax planning with reference to sale of scientific research assets.

[32 Hours]

Unit III

Tax Planning in respect of managerial remuneration-tax planning with respect to employee’s remuneration –simple problems-Special provisions relating to non-residents - Double taxation relief.

[12 Hours]

Unit IV

Tax planning with reference to business restructuring – Amalgamation – Demerger- Slump sale-Conversion of sole proprietary concern/partnership firm into company - Transfer of assets between holding and subsidiary companies.

[18 Hours]

Reference:

1. Singhania, Vinod K., KapilSinghania and Monica Singhania, "Direct Taxes Planningand Management" ,Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish., and Ravi Gupta, "Corporate Tax Planning and Management" , BharatLaw House, Delhi.
3. Pagare, Dinkar., "Direct Tax Planning and Management" , Sultan Chand and sons,New Delhi.
4. Goyal, S.P, Mehrotra H.C., "Direct Tax planning" ,SahityaBhawan, Agra.
5. Acharya, Shuklendra and M.G. Gurha, "Tax Planning under Direct Taxes" , ModernLaw Publication, Allahabad.
6. Mittal, D.P., "Law of Transfer Pricing" ,Taxmann Publications Pvt. Ltd., New Delhi.
7. Income Tax Reports, Company Law Institute of India Pvt. Ltd., Chennai.
8. Taxman, Taxmann Allied Services Pvt. Ltd., New Delhi.
9. Current Tax Reporter, Jodhpur.

Marks including choice:

Unit	Marks
I	10
II	20
III	10
IV	16
Total	56

ELECTIVE STREAM IV – MARKETING

CORE COURSE IV : MARKETING I – MARKETING PRINCIPLES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B04 COM	5	4	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: develop awareness about various marketing related terms
CO 2**:** identify the various marketing decisions
CO 3**:** understand about the international market scenario
CO 4**:** enumerate the various marketing channels
CO 4: understand international marketing and recent trends in marketing

Unit I : Introduction- Market and Marketing – Meaning- Nature scope and importance of marketing-modern concepts of marketing – marketing functions. Marketing orientations.

(15 Hrs)

Unit II: Marketing mix: Marketing mix – meaning- importance- the traditional components and additional components. Product- meaning- product planning and development – product life cycle (PLC) – Product time/ mix- Building brand equity-packing- labeling product positioning.

(18 Hrs)

Unit III: Pricing- Meaning and definition- steps in pricing – pricing strategies – types-consumer reactions – factors influencing consumer reactions. Pricing Methods Initiating and responding to price changes.

(17 Hrs)

Unit IV: Channels of distribution- Meaning and definition – Physical distribution – middlemen types-functions of middlemen- factors to be considered in selecting channels – modern channels of marketing – telemarketing - internet marketing- net work marketing customer relationship marketing. Logistics management. Channel management strategies.

(20 Hrs)

Unit V: International marketing management- .introduction, nature and concepts, approaches to international marketing, entry strategies, product pricing, promotion and branding policies in international marketing, recent trends in marketing: E marketing, Green Marketing, Mobile Marketing, Relationship Marketing.

(20 hrs)

Reference:

1.Kotler, Keller, Marketing Management, Pearson Publications
2. Fundamentals of marketing - William Stanton
3. Marketing Management - VS Ramaswamy& S Namakumari
4. Marketing Management - RajanSaxena
5. Marketing Management - Sherlakar .S.A
6. Marketing Management - Raman B.S
7. .Principles of Marketing - Philip Kotler

Marks including choice:

Unit	Marks
I	8
II	10
III	14
IV	14
V	10
Total	56

CORE COURSE VI : MARKETING II – CONSUMER BEHAVIOUR

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B06 COM	5	4	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the concept of consumer behaviour
CO 2: describe determinants of consumer behaviour
CO 3: Explain the consumer decision making process
CO 4: describe concept of consumer satisfaction

Unit I

Introduction to Consumer Behaviour- A managerial & consumer perspective; Need for studying consumer behaviour- Applications of consumer behaviour knowledge; current trends in Consumer behaviour; Market segmentation & consumer behaviour

[12 hours]

Unit II

Individual determinants of Consumer behaviour: Consumer needs & motivation; personality and self concept; consumer perception; learning & memory; nature of consumer attitudes; Consumer attitude formation and change

[14 hours]

Unit e III

Environmental determinants of consumer behaviour: Family influences; the influence of culture; subculture & cross cultural influences; group dynamics and consumer reference groups; social class & consumer behaviour.

[20 hours]

Unit IV

Consumer decision making process- types of buying- straight buy- Modified re-buy- New task buying types of products & decision making process- conveyance goods, shopping goods specialty goods Steps in decision making process - problem recognition- need, description, information – search- evaluation of alternatives – selection criteria- buying- post purchase behaviour.

[24 hours]

Unit V

Concept of Consumer Satisfaction; Working towards enhancing consumer satisfaction; sources of consumer dissatisfaction; dealing with consumer complaint. Concept of consumerism; consumerism in India; the Indian consumer; Reasons for growth of consumerism in India-Relevance of Consumer Protection Act, 1986.

[20 hours]

References

1. Consumer behaviour :Hawkings, Best Mc.Graw Hill International .
2. Consumer behaviour : Leon. G Schiffman
3. Consumer behaviour- Concepts &Applications :LoudsonDalla
4. Principles of Marketing : Philip Kotler
5. Consumer Behaviour In Marketing Strategy : John .A. Howard.
6. Consumer Behaviour In India :AnithaGhatale
7. Problems of Consumer Behaviour in India : A. Sarkar
8. Consumer Behaviour :Sontakki

Marks including choice:

Unit	Marks
I	8
II	10
III	14
IV	14
V	10
Total	56

CORE COURSE XI : MARKETING III – PROMOTION MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B11 COM	4	4	3

COURSE OUTCOME

CO 1: understand the term promotion and its importance
CO 2: enumerate various methods of sales promotion and its effects
CO 3: familiarise with the theory and practice of advertisement
CO 4: Prepare advertisement copy

Unit 1.

Promotion: Meaning and definition – importance of sales promotion- promotion mix tools-factors deciding promotion mix.

[15 Hours]

Unit II.

Advertising – meaning, objectives & importance - advantages – advertising effects – economic and social – advertising agency-advertising budgets - media – types – print - radio- TV & others – advantages & disadvantages.

[18 Hours]

Unit III.

Personnel Selling: Meaning- importance- principles of personal selling- steps in personal selling process

[12 Hours]

Unit IV

Sales promotion and publicity: Objectives – purpose- dealer promotion- consumer promotion methods and techniques – publicity- meaning, scope and objectives elements of publicity- public relations- press relation.

[18 Hours]

Unit V

Advertisement Copy: Preparation of advertisement copy- project work

[9 Hours]

Reference:

1. Advertising : Morris James .S
2. Advertising theory &practice :Sandya C.H and Trybanger
3. Marketing Practices and Marketing Strategy : B. Rasheed Ajay.
4. Foundations of Advertising Theory &Practice :Chunnawalia& K.C Sethia
5. Sales Promotion : Tony Puelus
6. Advertisement Management :Aaker Paul.

Marks including choice:

Unit	Marks
I	10
II	10
III	12
IV	14
V	10
Total	56

CORE COURSE XVI : MARKETING IV – MARKET RESEARCH

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B16 COM	4	4	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: .understand the concept market research , its importance and type.
CO 2; Explain the process involved in the marketing research
CO 3: appraise the various methods of collecting data and analysis
CO 4: understand the methods of writing report and prepare report by themselves.

Unit I

Marketing Research: Introduction – Meaning - definition- importance- nature and scope- objectives- Marketing Information System- need, importance and types- market research Vs marketing research limitations.

[12 Hours]

Unit II

Marketing Research Process: Problem identification – definition – developing a research proposal – research design – meaning and importance – steps in marketing research process.

[12 Hours]

Unit III

Sources of Data: Primary and secondary data- Relative advantages and disadvantages; methods of collection of primary data; construction of questionnaire and interview schedule; scaling and measurement; Sampling designs and sample size- decisions; organizing data collection & field force - collection methods- observations questionnaire-interview schedule – pilot survey and online survey.

[18 Hours]

Unit IV

Data analysis & interpretation: Need and importance –Editing, coding and tabulation of data- tools - parametric and non- parametric tests. –; techniques of data analysis; testing of hypothesis; tests of significance; analysis of associations; analysis of experiments; interpretation of data.

[20 hours]

Unit V

Report Writing and Presentation: Role & types of report; content of report; principles of report preparation; Presentation & Communication.

[10 Hours]

Suggested assignment: Preparation of a project report based on the market survey of a consumer product.

References:

1. Marketing Research : David. J Lucle& Ronald S. Robin
2. Marketing Research : Measurement & methods – Donald. S Tull& Dell Hoclis
3. Marketing Research Principles: Applications and cases - Sharma D.D
4 Marketing Research :Geol .B.S
5. Market Research : Paul Hague
6. Statistical Methods : S.P Guptha
7. Business Statistics : B.N Gupta
8. Research Methodology : O.R Krishnaswamy.
9. Research Methodology : C.R. Kothari

Marks including choice:

Unit	Marks
I	10
II	10
III	12
IV	14
V	10
Total	56

PART B
B.COM GENERAL AWARENESS COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HRS
1A11 COM	Business Statistics and Basic Numerical Skills	I	6	4	3
3A12 COM	Entrepreneurship Development	III	5	4	3
4A13 COM	General Informatics Skills (T+P)	IV	5(3+2)	4	2
4A14 COM	Environmental Studies and Disaster Management	IV	5	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	4	40*
INTERNAL	1	10

* 20 marks for theory and 20 marks for practical for courses having practical

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS	REMARKS
COMPONENT 1 Test paper	3	6	Minimum two test papers and mark should be awarded on the basis of average mark obtained by the student
COMPONENT 2 Assignment/ Seminar/	2	4	Department should keep a record of the work done

Internal mark for test papers should be given as per the following criteria;

Average mark obtained in the test paper	Percentage of internal mark
80% and above	100%
60% to 79%	80%
40% to 59%	60%
20 % to 39%	40%
Below 20%	20%

GENERAL AWARENESS COURSE I : BUSINESS STATISTICS AND BASIC NUMERICAL SKILLS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1AI1 COM	6	4	3

COURSE OUTCOME

After studying this course, students shall be able to;

CO 1: Define statistics and explain its importance, scope, applications and limitations
CO 2: Understand the basic knowledge of statistical techniques, which are applicable to business.
CO 3: understand basic concepts in mathematics, which are applied in the managerial decision making.
CO 4: Develop the basic mathematical skill needed for analyzing numeric problems related to business

Unit I: Introduction to statistics- Meaning, Definition, functions, importance and limitations- Statistical investigation- stages- sources of data- primary- secondary – Classification and tabulation- - Construction of frequency distributions.

(12 Hrs)

Unit II: Measures of Central Tendency – Meaning-requisites of good average- Arithmetic Mean – simple and weighted -Median - Mode - Geometric and Harmonic Mean (algebraic method only). **Measures of dispersion**- range, quartile deviation, mean deviation, standard deviation -Skewness

(28 Hrs)

Unit III: Index Numbers – meaning- definition- uses-problems in the construction of index numbers- types of index numbers- methods of construction of index numbers- Laspeyers', Paasche's, Fisher's, and Kelly's Methods- Test of adequacy- time reversal and factor reversal only.

(16 Hrs)

Unit IV: Matrix Algebra :Introduction –Definition –Types of Matrix-Matrix operations- Addition and subtraction- Matrix multiplication- Transpose of a matrix-Determinants of a square matrix-determinants of order two and order three-Inverse of a matrix-Solving simultaneous linear equations – Crammer's rule-Rank of a matrix.

(30 Hrs)

Unit V : **Set theory and set operations**- simple application of Venn diagram- Truth table and its applications - Linear simultaneous equations (up to 3 variables only)- Quadratic equations-Solution of linear inequalities (by geometric method only)- ratios and proportions.

(22 Hrs)

Reference:

1. Raymond Barnett, Michael Ziegler - Essentials of College Mathematics for Business, Economics,Life Sciences and Social Sciences
2. Sancheti and V.K.Kapoor -Business Mathematics
3. M.Raghavachari -Mathematics for Management
4. Dr. P.R. Vittal - Business Maths & Statistics
5. Sundaresan and Jayaseelan - An Introduction to Business Mathematics and Statistical Methods.
6. A K Arte & R V Prabhakar - A Text Book of Business Mathematics.
7. Sanchethi and Kapoor- Business Mathematics
8. Gupta S.P- Statistical Methods
9. Navaneethan P- Business Mathematics
10. R.S.N. Pillai, Mrs. Bhagavathi – Statistics
11. P.R. Vittal - Business Mathematics and Statistics

Marks including choice:

Unit	Marks
1	5
2	15
3	10
4	13
5	13
Total	56

GENERAL AWARENESS COURSE II : ENTREPRENEURSHIP DEVELOPMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3A12 COM	5	4	3

COURSE OUTCOME

After the completion of the course the learners should be able to

CO 1: Identify the characteristics of an entrepreneur
CO 2: describe the importance of entrepreneurs in the economic developmet of a nation
CO 3: identify the different types of entrepreneurs
CO 4: to strengthen their skill and quality as an entrepreneur

Unit I :

Concept of Entrepreneurship- meaning- definition- importance Functions- Distinction between entrepreneur and a manager. Types of entrepreneurs- Student entrepreneurship----concept and importance. Role of first generation entrepreneurs. Intrapreneur- Practices to entrepreneurship development Concept of women entrepreneurship-problems of women entrepreneurs. Assistance available to women entrepreneurs

(18 Hrs)

Unit II :

Factors affecting Entrepreneurial Growth-motives influencing entrepreneurs. Rural entrepreneurship-role of entrepreneur in Economic development. Social entrepreneurship. Factors affecting Entrepreneurial Growth-Rural entrepreneurship-role of entrepreneur in Economic development.

(18 Hrs)

Unit III:

Entrepreneurial motivation Motivating factors Achievement Motivation Entrepreneurial competencies Developing competencies. Institutional efforts and role of Government in developing entrepreneurship- Entrepreneurship Development Programme (EDP) - Need- Objectives-Course content and curriculum of EDP. Phases of EDP, Stories of successful entrepreneurs.

(16 Hrs)

Unit IV:

Launching of new enterprise. Sources of business ideas. Setting up of new business. Micro, Small & Medium Enterprises- MSMED Act 2006 - Characteristics- Objectives Importance MSMEs as a seed bed of entrepreneurship. Entrepreneurship incubators - Problems and prospects of MSMEs- Incentives and subsidies- Taxation benefits to MSMEs. Institutional finance to entrepreneurs' .project: meaning and features, project analysis and feasibility study. Contents of project report. Preparation of Project Report for a Micro enterprise.

(20 hrs)

Unit V

Support systems for entrepreneurs and MSMEs: Industries Board- State Small Industries Development Corporations- MSME Institute-DICs- Industrial Estates-Specialized institutions-Technical Consultancy Organizations lead bank schemes.Loans and advances available for entrepreneurs, schemes of financial institutions,(latest data} startups, role of universities and colleges in developing entrepreneurship. Role of NGOs.entreprenurial ecosystem in Kerala.

(18 Hrs)

Reference:

1. Entrepreneurial Development : P. Saravanavel
2. Entrepreneurial Development :C. B Gupta and N.P Sreenivasan
3. A complete Guide to Successful Entrepreneurship; G.N. Pandey
4. Business and Society Davis Keith and Williams C. Fredarick
5. Entrepreneurship : R.V. Badi& N V Badi
6. Entrepreneurship Development : S.S. Khanka
7. Entrepreneurship : Robert D Hisrich and Michael P Peters
8. Project Evaluation and Management :Singh and Mahadev
9. MSME Act 2006

Marks including choice:

Unit	Marks
1	10
2	10
3	12
4	14
5	10
Total	56

GENERAL AWARENESS COURSE III : GENERAL INFORMATICS SKILLS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4A13 COM	5(3+2) (T+P)	4((3+1)	Theory 2 Practical 1

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: Explain the Fundamentals of Computers the use of computers in day to day application
CO 2: Up to date and expand the basic informatics skills necessary in the emerging knowledge society
CO 3: Effectively utilize the digital knowledge resources for their studies
CO 4: State the areas where IT can be used effectively
CO 5: Perform accounting by using the appropriate accounting packages

Unit I

Overview of information Technology. Features of Modern Personal Computer and Peripherals – Computer Networks – Types of Networks – Components of Networks – Topology – Internet – Uses of Internet.

[10 Hours]

Unit II

Social Informatics: IT and society – issues and concerns -Digital divide – Cyber ethics – Cybercrimes – Cyber Laws – Cyber addictions- Information over Load – Health Issues – Guide lines for Proper Usage of computers and internet. E Waste.

[10 Hours]

Unit III

IT Applications :E Governance– overview of IT Application in Medicine, Health care, Business and Commerce.– Industry.

[10 Hours]

Unit IV

Knowledge Skills for Higher Education : Data, Information and Knowledge - Knowledge Management -Internet as a knowledge repository - Academic search techniques - Case study of academic websites – Basic concepts of IPR – Copyrights and Patents - Introduction to use of IT in teaching and learning - Case study of educational software - Academic Service – INFLIBNET – NICENET - BRENT.

(12 Hours)

Unit V

Programmes for Office Management: MS word – window concepts – Menus, tiles, Edit, View, tools, tables, Mail Merge. MS Excel – Spread sheet – operators - Arithmetic – Relation Functions –Formulae – Payroll Preparation. MS Power point - creating slides and presentations, adding media clips and charts, special effects, setting slid timings

[24 Hours]

Unit VI

Computerized Accounting (Using Accounting Software) Meaning, features and advantages of computerised Accounting – Company Creation- Accounts Information- Ledger – Groups– Cost Centers – Accounts with inventory- stock item and stock Group creation – voucher – types - entry – P/L A/c, B/S, Bank Reconciliation.

[24 Hours]

Reference.

1.V. Rajaraman : Introduction to Information Technology. PrenticeHall
2. Technology in Action : Pearson.
3. Alexis Leon & Mathews Leon : Computer Today, Leon Vikas.
4. A.K.Nandani& K.K Nandani : Tally 6.3
5. V.K.Jain : Computer Fundamentals
6. Vijay Kumar Khurana : Management of Information Technology - B.Jolly&K.S.Jolly; SunithaPrakasan
7. Rechard Peterson Negus: Linux Bble, Wiley India Private Limited.
8. Mike Mc Grath, Linux in Easy steps, Dream Tech Press New Delhi

Marks including choice:

Unit	Marks
I	4
II	6
III	6
IV	8
V	4
VI	4
Total	32

Maximum mark for theory 20
Maximum mark for practical 20

GENERAL AWARENESS COURSE IV : ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4A14 COM	5	4	3

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: Understand the components of environment and need for the protection of environment

CO 2: Understand the effect of pollution on environment and the ways of protecting the environment

CO 3: Explain the social issues relating to environmental pollution

CO 4: Clearly understand the various environmental hazards and the ways of managing disaster.

Unit I :

Brief discussion on the components of the Environment, Scope and importance of Environmental studies- Environmental problems associated with the exploitation of natural resources- Environmental protection, major environmental movements in India. Environment protection Act 1986- impacts on companies, violation and penalties, Environment Impact Assessment, Environment Protection related compliances for start-up manufacturing enterprises.

(15 hours)

Unit II :

Environmental Pollution- types, causes, effects- Bhopal gas tragedy, A brief discussion on - Global Warming- Climate Change- Ozone Depletion,-Acid Rain, Standards and control measures required by industries in compliance to The Air (Prevention of Pollution and Control) Act 1989, Water Pollution, importance of water pollution control and steps required to be taken by industries eg; Sewage treatment plant, water treatment plant etc. Relevance of environment legislation to business enterprises, Legislation vs. Social obligation of the business

(20 hours)

Unit III:

Social issues and environment- unsustainable and sustainable development, urban problems related to energy, water conservation, water harvesting, resettlement and rehabilitation of people, environmental ethics, waste land reclamations, consumerism and waste products

(15 hours)

Unit IV :

Environmental hazards and disasters-Meaning, types-natural hazards and disaster-Planetary hazards/Disasters: (a) Endogenous Hazards: volcanic eruption-Earth quakes-Landslides (b)Exogenous Hazards :infrequent events-cyclones-lightning-hailstorms. Cumulative atmospheric hazards/disasters: floods-Droughts-Heat waves. Extra planetary hazards/disasters. Man induced hazards and disasters: physical hazards/disaster-soil erosion-chemical hazards/disaster.

(20 Hours)

Unit V:

Phases of disaster management-Stages:1)pre-disaster stage(preparedness),2)Emergency stage, 3)post disaster stage .Institutional framework of disaster management-disaster mitigation institutions, education on disaster, community involvement in disaster management, role of media.

(20 Hours)

Reference:

1.Environmental Science : Cunnigham TMH
2.Environmetal Studies: AK De & A K De,New Age International
3.Environmetal management :n K Oberoi,EXCEL BOOKS
4.Environmetal pollution ControlEngineering : C S Rao,New Age International
5.Ecosystem Principles & Sustainable Agriculture :Sithamparanathan,Scitech
6.DisasterManagemen: R B Singh,RawatPublications,New Delhi
7.DisasterManagement,H K Gupta, University Press,India
8.An Overview on Natural and Man Made Disaster & their 44 Reduction:R K Bhandani, CSIR New Delhi.

Marks including choice:

Unit	Marks
I	10
II	13
III	10
IV	13
V	10
Total	56

PART C

B.COM COMPLEMENTARY ELECTIVE COURSES

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HOURS
2C01 COM	Quantitative Techniques For Business Decisions	II	6	4	3
3C02 COM	Business Regulatory Framework	III	4	4	3
3C03 COM	Business Economics	III	5	4	3
4C04 COM	Corporate Law and Business Regulations	IV	4	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	4	40
INTERNAL	1	10

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS	REMARKS
COMPONENT 1 Test paper	3	6	Minimum two test papers and mark should be awarded on the basis of average mark obtained by the student
COMPONENT 2 Assignment/ Seminar	2	4	Department should keep a record of the work done

Internal mark for test papers should be given as per the following criteria;

Average mark obtained in the test paper	Percentage of internal mark
80% and above	100%
60% to 79%	80%
40% to 59%	60%
20 % to 39%	40%
Below 20%	20%

COMPLEMENTARY COURSE I: QUANTITATIVE TECHNIQUE FOR BUSINESS DECISIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2C01 COM	6	4	3

COURSE OUTCOME

After studying the course, students should be able to,

CO 1:- Acquaint with the basic statistical tools, which can be applied in business and economic situations.
CO 2:- Develop knowledge in quantitative techniques, which help in tackling various problems for modern business.
CO 3:- Understand and solve problems in probability, correlation and regression.
CO 4:- Understand the effect of trend and seasonal variations on business.
CO 5:- Familiarize with the testing of hypothesis.

Unit I

Correlation- Meaning-Classification- Methods- Scatter Diagram- Karl Pearson's Coefficient of Correlation- Spearman's Rank Correlation.

[15 Hours]

Unit II

Regression Analysis: Meaning And Definition- Types of Regressions-Regression Lines-Regression Equations.

[20 Hours]

Unit III

Time Series Analysis: Meaning-Components of Time Series-Methods of Measures of Trend- Moving Average Methods, Methods of Least Squares.

[23 Hours]

Unit IV

Statistical Inference: Testing Of Hypothesis-Meaning-Characteristics- Null Hypothesis and Alternative Hypothesis-Type I and Type II Errors –Procedure For Hypothesis Testing- Level Of Significance-Two Tailed and One Tailed Test- Non Parametric Test-Chi Square Only (Simple Problems) –Parametric Test- Z Test- Meaning and Assumptions only- T test- Meaning-Assumptions- One Sample T test only.

[25 Hours]

Unit V

Probability- Meaning and Definition- Important Terms- Theorems of Probability- Addition and Multiplication Theorem-Conditional Probability- Bayes Theorems- Permutation and Combination. Probability Distributions- Binomial Distribution-Poisson Distribution and Normal Distribution. (Simple Problems Only).

[25 Hours]

References:

1. C .R.Kothari: Quantitative Techniques
2. S.P.Gupta: Statistical Methods, Sulthan Chand And Sons, New Delhi 2
3. C B Gupta & Vijay Gupta: An Introduction To Statistical Methods, Ane Books Pvt Ltd
4. P. N. Arora& Mrs.S.Arora: Quantitative Aptitude vol I & II, S Chand & Co Ltd, New Delhi
5. S.L.Aggarwal & S L Bhardwaj: Fundamentals of Business Statistics, Kalyani Publishers
6. P K Gupta & D S Hira: Operations Research, S Chand & Co Ltd, New Delhi
7. L R Potti: Operations Research, Yamuna Publications,Tvm

Marks including choice:

Unit	Marks
I	12
II	10
III	12
IV	12
V	10
Total	56

COMPLEMENTARY COURSE II: BUSINESS REGULATORY FRAMEWORK

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3C02 COM	4	4	3

COURSE OUTCOME

After studying this course, the students shall be able to,

CO 1: Understand the nature of contracts and the essential elements of a valid contract
CO 2: Explain the difference between a valid contract and a void contract
CO 3: Understand the breach of contract and remedies available for a breach of contract
CO 4: Understand various kinds of special contracts like indemnity, guarantee, bailment and agency contract

Unit I:

Indian Contract Act – Contract –meaning- types –Essentials of valid contract –Offer – types of offer – essential elements – Revocation-- Acceptance – essentials – Communication of offer and acceptance- Consideration – Essentials – stranger to the consideration- exceptions to consideration-Capacity to contract- minor-unsound mind - persons disqualified by law.

(15 Hrs)

Unit II:

Free consent – meaning – Coercion – Undue influence – Misrepresentation – Fraud – Mistake (Basic concepts of these 5 elements) – Legality of object – Contracts expressly declared to be void- wagering contract-contingent contract.

(12 Hrs)

Unit III:

Performance of Contract – Modes of performance-Tender and its essentials-Appropriation of payments- Discharge of Contract- ways of discharging contract- Breach of Contract-Remedies of breach of contract – Quasi contract.

(15 Hrs)

Unit IV:

Special Contracts – Indemnity contracts – Guarantee contract – Differences – Kinds of Guarantee - Rights, duties and discharge of surety – Contract of Agency – Creation and termination of Agency.

(14 Hrs)

Unit V:

Bailment and Pledge – Essentials – Kinds of Bailment – Rights and duties of Bailer and Bailee –Sale of goods Act – sale and agreement to sell – Conditions and Warranties – Express and Implied – Doctrine of Caveat emptor – Unpaid seller –rights and duties (As per Transfer of Properties Act)

(16 Hrs)

Books for Reference:

1. Mercantile Law, Chowla and Garge
2. Mercantile Law – N D Kapoor
3. Business and Corporate Law – L R Potti
4. Mercantile Law – R S N Pillai and Bhagavathy

Marks including choice:

Unit	Marks
I	14
II	10
III	12
IV	10
V	10
Total	56

COMPLEMENTARY COURSE III: BUSINESS ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3C03 COM	5	4	3

COURSE OUTCOME

After studying this course, students shall be able to;

CO 1**:** Understand the concept of economics and its use in business
CO 2: Understand the concept of demand, elasticity and demand forecasting
CO 3: Understand production function and law of production
CO 4: Understand the methods of determining price of a product
CO 5: Explain the methods of computing national income.
CO 6: Conceive the developmental issues of Indian economy and Kerala economy

Unit I:

Managerial Economics:- Economics- meaning- definitions -Differences between micro economics and macro economics - Managerial economics-– - Definition and characteristics – Nature and Scope – characteristics- distinction between managerial economics and general economics - Relationship of managerial economics with other disciplines – role and responsibility of managerial economist.

(18 Hrs)

Unit II:

Demand estimation- demand- Law of demand-demand curve- exceptions of law of demand-elasticity of demand – price – income- advertisement- cross- uses- measurement- Law of diminishing marginal utility. Supply- determinants- Law of supply - Demand forecasting – short term and long term- methods of forecasting- forecasting demand for new product.

(20 Hrs)

Unit III:

Production and production function- Cobb Douglas production function- law of production – law of diminishing returns – law of returns to scale - isoquants, isocost, optimum combination of inputs, economies and diseconomies of scale.

(15 Hrs)

Unit IV:

Pricing and pricing policies- objectives of pricing - factors affecting pricing policy- types of pricing- cost plus pricing – marginal cost pricing – going rate pricing – BEP pricing – product line pricing – pricing of a new product.

(15 Hrs)

Unit V: National Income –concept and meaning - Computation of NI- Methods and Difficulties - Economy's income and expenditure – Measurement of GDP –components of GDP – Real versus nominal GDP –GDP deflator – monitory and fiscal policies- pros and cons –Demonetization –meaning – objects and impact. Development issues of Indian economy- Poverty, Inequality, Unemployment and Black money–Features of Kerala economy-Kerala model of development- decentralized planning in Kerala.

(22 Hrs)

Reference:

1. R.L. Varshney and K.L. Maheswari, Managerial Economics
2. Ahuja. HL; Business Economics, S. Chand & co.
3. D.N. Dwivedi, Managerial Economics
4. Dr. S. Sankaran, Managerial Economics
5. DM Mithani: Business Economics
6. Seth M L Text Book of Economic Theory
7. K K Dewett: Economic Theory
8. Dutt & Sundaram: Indian Economy
9. Petersen &. "Lewis: Managerial Economics
10. Mote V L peul. S & Gupta G S: Managerial Economics
11. H. Craig Petersen & W. Cris lewis: Managerial Economics
12. Dr. P.N. Reddy and H.R, Appanaiah : Essentials of Business Economics
13. Barry Keating and J. Holton Wilson: Managerial Economics
14. Dwivedi, D.N: Microeconomics: Theory and Applications,
15. N. Gregory Mankiw, 'Macroeconomics'
16. B A Prakash, Kerala's Economic Development Emerging Issues and Challenges

<u>Marks including choice</u>:

Unit	Marks
I	10
II	12
III	12
IV	10
V	12
Total	56

COMPLEMENTARY COURSE IV: CORPORATE LAW AND BUSINESS REGULATIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4C04 COM	4	4	3

COURSE OUTCOME

After studying this course, students should be able to;

CO 1: Understand the provisions of Companies Act 2013
CO2: Describe the procedure for the formation, registration and winding up of the company
CO 3: Explain various kinds of companies and the authorities of companies in India
CO 4: Understand the management and administration of Companies

Unit I:

Companies Act 2013- Definition- Features- Classification- Authorities of Company Law- Central Govt. - Company Law Board- SEBI- Liquidator- Court- Registrar-Tribunal.

(12 Hrs)

Unit II:

Formation of Company- Promotion- Stages-Types of promoters-Registration & Incorporation- raising of capital- Commencement of Business- Lifting Corporate Veil.

(13 Hrs)

Unit III:

Memorandum of Association- Contents- Articles of Association- Contents- Difference-Table A- Alterations- Doctrine of Ultravires- Constructive notice & indoor management-Prospectus- types-Contents-- Misstatement in prospectus.

. (15Hrs)

Unit IV:

Members of Company- Acquiring membership-Termination of membership-Rights-Duties- Obligations- Directors- Appointment-Qualifications & Disqualifications-Retirement & Removal of Directors.

(12 Hrs)

Unit V:

Company meeting- General Meeting- Board Meeting- Class Meeting- Essential of valid Meetings- chairman-Motion- Resolution- types of resolutions-Methods of voting.

(10 Hrs)

Unit VI:

Winding up- Modes of Winding Up- Winding up by the Tribunal- provisions-voluntary winding up – conditions and provisions - Liquidator- Rights , powers & Duties of Liquidator- effects of winding up.

(10 Hrs)

Books for Reference:

1. Mercantile Law, M C Shukla
2. Business Law, R S N Pillai, Bhagavathi
3. Company Law P PScogna
4. Business & Corporate Law, L R Potti

Marks including choice:

Unit	Marks
I	8
II	8
III	10
IV	10
V	10
VI	10
Total	56

PART D

B.COM GENERIC ELECTIVE COURSES

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

OFFERED TO STUDENTS OF OTHER DEPARTMENTS

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HOURS
5D01 COM	Basic Accounting	V	2	2	2
5D02 COM	E-Commerce	V	2	2	2
5D03 COM	Principles of Management	V	2	2	2
5D04 COM	Insurance and Risk Management	V	2	2	2
5D05 COM	Financial Services	V	2	2	2

EVALUATION

ASSESSMENT	WEIGHTAGE	MARKS
EXTERNAL	4	20
INTERNAL	1	5

INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS	REMARKS
COMPONENT 1 Test paper	3	3	
COMPONENT 2 Assignment/seminar	2	2	

GENERIC ELECTIVE COURSE I: BASIC ACCOUNTING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D01 COM	2	2	2

COURSE OUTCOME

After studying the course, students shall be able to;

CO 1: describe the basic accounting concepts
CO 2: record the business transactions in the proper books of accounts
CO 3: prepare financial statements of a sole trading concern

Unit I

Introduction :Basic Accounting concepts - Kinds of Accounts – Double Entry Book Keeping – Rules of Debit and Credit.

[6 Hours]

Unit II

Recording of Transactions: – Preparation of Journal and Ledger Accounts- Simple problems .

[8 Hours]

Unit III

Subsidiary books - cash book – types of cash book – problems(single column and two column only) -purchase book - sales book - sales return - purchase return books –Journal proper

[6 Hours]

Unit IV

Trial balance – Meaning and purpose-Preparation of trial balance

[6 Hours]

Unit V

Financial Statements –Trading and Profit & Loss Account – Balance sheet (of sole trading concern) – Simple Problems

[10 Hours]

(Theory and problems may be in the ratio of 30% and 70% respectively)

Reference Books:

1. Grewal, T.S: Double Entry Book Keeping
2. Jain and Narang: Advanced Accountancy
3. Shukla and Grewal: Advanced Accountancy
4. Gupta and Radhaswamy: Advanced Accountancy
5. Gupta R.L: Advanced Accountancy

<u>Marks including choice</u>:

Unit	Marks
I	4
II	6
III	8
IV	4
V	10
Total	32

GENERIC ELECTIVE COURSE II: E-COMMERCE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	**5D02 COM**	**2**	**2**	**2**

COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: understand the concept of E commerce and its framework.
CO2: understand the concept of web commerce
CO 3: Acquire knowledge regarding cyber laws

Unit I

Introduction : Business operations – Basic features – Elements- limitations of traditional commerce – Ecommerce- origin- growth- basic technologies- features- components, advantages, limitations- types of E-commerce.

[6 Hours]

Unit II

E-Commerce – operational framework & security .Computer system- Hardware – Software- Networks- Types- Extranet- Internet- Basics- feature- internet-services- Email– Internet Addressing – URL- www- web browsers- types- internet protocol- HTML – HTTP- Internet vulnerable- Hacking, Data theft, vandalism, cyber frauds, cookies, spanner etc- protection measures- pass words- firewalls, encryption , website protection .

[10 Hours]

Unit III

Web Commerce: Electronic market place- features- advertising and online marketing, purchase online- Handling money on net – Electronic Payment Systems- types- credit cards- electronic Cheque- Electronic Data Interchange – meaning, components- business application.

[10 Hours]

Unit IV

Cyber Laws: Information Technology Act 2000 – scope- definitions – objectives, authentication of electronic records – powers of central Govt.- Certifying authority, duties of subscribers – digital signature, private key, public key- penalties and adjudication - CRAT- Offences.

[10 Hours]

Reference:

1. Information Technology : BS Jolly & K.S Jolly (SuchithaPrakashan)
2. A profile of information Technology-Computer Digest : HR Banerjee (Jaico)
3. Electronic Commerce :Efraim Turban, Jae Lee, David King& Michael Chung (Pearson Edn. Asia,
Delhi)
4 Frontiers of electronic commerce : Ravi Kalkotta& Andrew BWhinston (Wesley,
Delhi)
5. E-Commerce John Wiley & Sons, HearyEt e

Marks including choice:

Unit	Marks
I	6
II	10
III	8
IV	8
Total	32

GENERIC ELECTIVE COURSE III: PRINCIPLES OF MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D03 COM	2	2	2

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: understand the basic concept of management
CO2: describe the functions of management

Unit 1.
Introduction to Management: - Meaning and definition, scope, importance, Management and administration,

(4 Hrs),

Unit 2-
Planning: - Meaning, objectives, types of plans, steps in planning and limitations of planning.

(8 Hrs)

Unit 3-
Organising: - Concept, significance, types- formal and informal, line and staff and functional, centralisation, decentralisation,

(10 Hrs)

Unit 4 –
Staffing: - Importance, sources of recruitment and selection, training and development. (conceptual framework only)

(8 hrs)

Unit 5 –
Directing and Controlling: - Meaning and elements of direction -Controlling- Meaning – steps..

(6 Hrs)

References;

1. Koontz.O. Donnel, Principles of management, Tata Mc grawhill, publishing co, New Delhi.
2. L. M. Prasad, Principles of Management, Sultan Chand & sons, New Delhi.
3. R.C. Bhatia, Business organisation and management, Ane books, P. Ltd. New Delhi**.**
4. Tripathy Reddy, Principles of Management Tata Mc Graw Hill Publishers, New Delhi.

<u>Marks including choice</u>:

Unit	Marks
I	4
II	8
III	8
IV	8
V	4
Total	32

GENERIC ELECTIVE COURSE IV: INSURANCE AND RISK MANAGEMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D04 COM	2	2	2

COURSE OUTCOME

After studying the course, the students shall be able to;

CO 1: explain the concept of insurance, its regulations and types
CO 2: understand the concept insurance risk and its management

Unit I:
Introduction- Meaning, definition, nature and functions of insurance-Principles of insurance- insurance documents.
(6 hours)

Unit II:
Insurance sector reforms in India- IRDA- Role and functions- TAC- Insurance Ombudsman.
(10 hours)

Unit III:
Types of insurance- Meaning and features of life – Marine, Health, Fire and other diversified insurance products-Micro insurance- Rural insurance.
(8 hours)

Unit IV:
Insurance risk-meaning and types-sources of risk- Risk Management : meaning and definition-personal and corporate risk management-stages in risk management process (A brief study).
(12 hours)

Reference:

1. Principles of Risk management &Insurance : George E Rejda
2. Risk Management &Insurance : Scott Harrington
3. Risk Management &Insurance : C. Arthur Williams
4. Insurance Industry : ICFAI Publication.

Marks including choice:

Unit	Marks
I	6
II	6
III	10
IV	10
Total	32

GENERIC ELECTIVE COURSE V: FINANCIAL SERVICES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D05 COM	2	2	2

COURSE OUTCOME

After studying this course, the students shall be able to;

CO 1: Explain financial system and its constituents
CO 2: identify the different financial services provided by financial institutions
CO 3: develop a basic understanding of stock broking

Unit I

Financial system-Meaning-Nature and Role- Indian Financial System-Financial Intermediaries: Banking Institutions.-Non- Banking Institutions: Mutual Funds-Insurance companies -Housing finance Companies-Financial markets-Capital Markets & Money Markets -Financial Instruments: short-medium, long term

[15 Hours]

Unit II

Financial Services- meaning-importance- components-Depository Services- Custodial services-Credit Rating-Credit rating agencies- procedure-methodology-symbols and grades. Factoring- Forfeiting - merchant Banking-Leasing-Hire purchase-Guaranteeing-Portfolio management-Under writing-Venture capital. (Basic Concepts only)

[16 hours]

Unit III

Stock broking- Stock brokers-Sub brokers-Foreign brokers- Stock market trading-Derivative trading

[5 hours]

Reference:

1. Indian Financial System Bharati V .Pathak
2. Merchant Banking and Financial services Dr .S.Gurusamy
3. Indian Financial system Dr .S. Gurusamy
4. Indian Financial system P.N.|VarshneyD.K.Mittal
5. Financial Services D.JosephAnbarasa ,V.K.Boominathan
P.Manoharan&G.Gnanaraj
6. Financial Services : M.Y Khan.

<u>Marks including choice</u>:

Unit	Marks
I	14
II	12
III	6
Total	32

PART E

PATTERN OF QUESTION PAPERS

FOR CORE COURSES, GENERAL AWARENESS COURSES AND COMPLEMENTARY ELECTIVE COURSES (NOT HAVING PRACTICAL)

------ SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)
(*COURSE CODE*). (*COURSE TYPE*). (*COURSE TITLE*)

Time: 3 Hrs Max. Mark: 40

PART- A

Answer any SIX questions from the following. Each question carries 1 marks

1.
2.
3.
4.
5.
6.
7.
8.

(6 X 1 = 6 marks)

PART – B

Answer any SIX questions from the following. Each question 3 marks

9.
10.
11.
12.
13.
14.
15.
16.

(6 X 3 = 18 marks)

PART - C

Answer any TWO questions from the following. Each question carries 8 marks

17.
18.
19.

(2 X 8= 16 marks)

FOR CORE COURSES, GENERAL AWARENESS COURSES AND COMPLEMENTARY ELECTIVE COURSES (HAVING PRACTICAL)

------ SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)

(*COURSE CODE*). (*COURSE TYPE*). (*COURSE TITLE*)

Time: 2 Hrs Max. Mark: 20

PART- A

Answer any THREE questions from the following. Each question carries 1 marks

1.
2.
3.
4.

(3 X 1 = 3 marks)

PART – B

Answer any THREE questions from the following. Each question 3 marks

5.
6.
7.
8.

(3 X 3 = 9 marks)

PART - C

Answer any ONE question from the following. The question carries 8 marks

9.
10.

(1 X 8= 8 marks)

FOR GENERIC ELECTIVE COURSE

------ SEMESTER -------- DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)

(*COURSE CODE*). (*COURSE TYPE*). (*COURSE TITLE*)

Time: 2 Hrs   Max. Mark: 20

PART- A

Answer any THREE questions from the following. Each question carries 1 marks

1.
2.
3.
4.

(3 X 1 = 3 marks)

PART – B

Answer any THREE questions from the following. Each question 3 marks

5.
6.
7.
8.

(3 X 3 = 9 marks)

PART - C

Answer any ONE question from the following. The question carries 8 marks

9.
10.

(1 X 8= 8 marks)

PART F

MODEL QUESTION PAPERS

I SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)

1B01COM (CORE I) : MANAGEMENT CONCEPTS AND PRINCIPLES

Time: 3 hours **Mark: 40**

Section A

Answer any six questions in one or two sentences. Each question carries 1 mark

1. Define the term management.
2. What do you mean by systems approach to management?
3. What is functional organization?
4. Explain the term 'motivation'.
5. Who is an autocratic leader?
6. What do you mean by corporate social responsibility?
7. What is TQM?
8. What is meant by controlling in management?

(6 x 1 =6)

Section B

Answer any six questions in not exceeding one page. Each question carries 3 marks

9. Examine the nature and purpose of organization.
10. What are the principles and techniques of directing?
11. Enumerate the importance of motivation in an organization.
12. Explain the applicability of theory X and Y in motivating employees in an organization.
13. Briefly describe the environmental issues in a business organization.
14. What do you mean by stress management? What are its importance?
15. Explain the fish bone diagram
16. Discuss the ways in which planning and controlling are related

(6 x 3 = 18)

Section B

Answer any two questions in not exceeding three pages. Each question carries 8 marks

17. What is scientific management and explain the principles of scientific management.
18. Define planning and explain the steps involved in the planning process.
19. What do you mean by business ethics? Explain the characteristics and factors influencing business ethics.

(2 x 8 = 16)

I SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)

1A11COM (GENERAL AWARENESS COURSE. I): BUSINESS STATISTICS AND BASIC NUMERICAL SKILLS

Time: 3 hours **Mark: 40**

Section A

Answer any six questions. Each question carries 1 mark

1. Define standard deviation.

2. What is statistical units?

3. Write the formulae of Standard deviation of the combined series.

4. solve using crammer's rule:

$2x-3y = 3$

$4x-y =1$

5. If A = {1,4,7,10}, B = {2,4,5,8}, U = {1,2,3,4,5,6,7,8,9,10}

Find A′ n B

6 . Construct a truth table for

(P ^ q) ^ ~P)

7. Represent A∩ B by using venn diagram, provided A and B have common element?

8. What is trace of a matrix. Give an example (6 x 1 =6)

Section B

Answer any six questions. Each question carries 3 marks

9. Find out Quartile Deviation from the following

X:	10	20	40	80	50	42	45
F:	7	5	8	9	20	8	3

10. From the following calculate the mEan deviation about median

Class:	10-20	20-30	30-40	40-50	50-60	60-70
F :	8	12	28	18	7	4

11. The mean and Standard Deviation of 200 items were found to be 60 and 20 respectively. At the time of calculation, two items were wrongly taken as 3 and 67 instead of 13 and 17. Find correct mean and standard deviation.

12. A town has total population of 50000 out of it 28 000 read ' patriot' and 23000 read ' Times of India' while 4000 read both the news papers. Indicate how many read neither patriot, nor time of India?

13. Prove that A U (B UC) = (A n B) U (A n C) with the help of venn diagram

14. Solve the system of equation by using matrixes

$$5x-6y+4z = 15$$
$$7x+4y-3z = 19$$
$$2x+y+6z = 46$$

15. By Means of truth table show that:

$$\sim (P \Rightarrow q) = P \wedge \sim q$$

16. find the determinant of

$$\begin{vmatrix} \boldsymbol{1} & \boldsymbol{2} & \boldsymbol{1} \\ 2 & 3 & 1 \\ 1 & 3 & 1 \end{vmatrix}$$

(6 x 3 = 18)

Section C

Answer any two questions. Each question carries 8 marks

17. .From the prices of Shares of A company and B company given below, state which is more stable in value.

A:	55	54	52	53	56	58	52	50	51	49
B:	108	107	105	105	106	107	104	103	104	101

18..From the following find out Fishers Price Index and also prove Time Reversal and Factor reversal test are satisfied by it.

Commodity	Year 2005		Year 2007	
	Price	Quantity	Quantity	Price
A	10	8	10	12
B	15	12	15	20
C	9	7	10	10
D	12	6	9	15

19 solve the following system of equations

$$7x-4y-20z = 0$$
$$10x-13y-14z = 0$$
$$3x+4y-9z = 11$$

(2 x 8 = 16)

II SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)

2C01 COM (COMPL- I) QUANTITATIVE TECHNIQUE FOR BUSINESS DECISIONS

Time: 3 hours **Max. Mark: 40**

Section A

Answer any six questions. Each question carries 1 mark

1. Write regression equation X on Y.
2. Define conditional probability.
3. Mention the components of time series.
4. What is the relationship between correlation coefficient and regression coefficient?
5. What do you understand by binomial distribution?
6. What is the probability of getting 3 white balls in a draw of 3 balls from a box containing 5 white and 4 black balls?
7. In the study of regression equations, following values were obtained. Regression coefficient of Y on X = .25, r = .42 and SD of Y = 4. Find SD of X?
8. What is positive and negative correlation?

(6 x 1 =6)

Section B

Answer any six questions. Each question carries 3 marks

9. Explain the usefulness of the study of regression.
10. Coefficient of correlation between two variable X and Y is 0.48. Their co variation is 36. The variance of X = 16. Find the SD of Y series?
11. Two judges in a dance completion rank 12 entries as follows.

X	1	2	3	4	5	6	7	8	9	10	11	12
Y	12	9	6	10	3	5	4	7	8	2	11	1

What degree of relationship is there between the judgments of the two judges?

12. A bag contains 6 white, 4 red and 10 black balls. Two balls are drawn at random. Find the probability that they will be both black?
13. Distinguish between cyclic and seasonal variations?
14. Briefly explain Type I and Type II errors.
15. Explain;
    a) Mutually exclusive events
    b) Random experiments
    c) Independent events
16. Calculate the coefficient of correlation for the following data;

X	9	18	18	20	20	23
Y	23	33	23	42	29	32

(6 x 3 = 18)

Section B

Answer any two questions. Each question carries 8 marks

17. Calculate trend values by taking 3 yearly period of moving average from the following data.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Sales	5	7	9	12	11	10	8	12	13	17	19	14	13	12	15

18. a) A coin is tossed 6 times. What is the probability of obtaining four or more heads?

b) A life insurance salesman sells on an average 3 life insurance policies per week. Use poisson's law to calculate the probability that in a given week he will sell 2 or more policies but less than 6 policies.

19. What is "Hypothesis"? Explain its characteristics. Also explain Chi square test and Z test.

(2 x 8 = 16)

II SEMESTER B.COM DEGREE (CBCSS) EXAMINATION (*MONTH, YEAR*)

2 B02COM(CORE II) : FUNCTIONAL APPLICATIONS OF MANAGEMENT

Time: 3 hours **Max. Marks: 40**

SECTION A

Answer any six questions in one or two sentences. Each question carries 1 mark

1. Explain the tem Over capitalization.
2. Define financial planning.
3. What is social marketing?
4. What is market segmentation?
5. What is brand equity?
6. What is job analysis?
7. What is induction?
8. What is kaisen?

(6 x 1 = 6)

SECTION B

Answer any six questions in not exceeding one page. Each question carries 3 marks

9.Explain the Qualities of a sound financial PLAN.

10. What is working capital? Explain the factors influencing the working capital decision of a firm.
11. Explain product positioning.
12. What is marketing mix? Explain its elements.
13. Explain the concept of Product life cycle.
14. Briefly explain the steps in selection process.
15. What are the qualities required for an efficient HR manager?
16. Explain the scope of HRM in the modern business environment.

(6 x 3 = 18)

SECTION C

Answer any two questions in not exceeding three pages. Each question carries 8 marks

17. What is capital structure? Explain the Factors governing capital structure.
18. What is performance appraisal? Explain the methods of performance appraisal.
19. Explain the bases and pattern of Market segmentation

(2 x 8 = 16)

KANNUR UNIVERSITY

(Abstract)

B Sc Chemistry/ B.Sc.Biochemistry/B.Sc.Polymer Chemistry Programmes -Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad/C2/12380/2019 Civil Station P.O Dated 20/06/2019

Read:- 1. U.O.No.Acad.C2/429/2017 dt.10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O No.Acad.C2/429/2017 Vol.II dt.03-06-2019
4. The Minutes of the meeting of the Board of Studies in ChemistryUG held on 07-06-2019
5. The Syllabus submitted by the Chairperson, Board of Studies in Chemistry (UG)dated 13/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies, Workshops and discussions.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Chemistry (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc.Chemistry/B.Sc. Biochemistry/ B.Sc.Polymer Chemistry Programmes to be implemented with effect from 2019 Admission.

--2

5. As per paper read (5) above, the Chairperson, Board of Studies in Chemistry (UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc. Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry programmes.
6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc Chemistry, B.Sc Biochemistry and B.Sc Polymer Chemistry programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in Affiliated colleges with effect from 2019 Admission, subject to reporting to the Academic Council.
7. The Scheme, Syllabus & Pattern of Question Papers of B.Sc Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry Programmes are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR(ACADEMIC)
for REGISTRAR

To

The Principals of Colleges offering B.Sc Chemistry/ B.Sc Biochemistry/ B.Sc Polymer Chemistry programme

Copy to:-

1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Chemistry (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, CHEMISTRY (UG)

SYLLABUS FOR CHEMISTRY CORE COURSE
COMPLEMENTARYELECTIVE COURSE AND GENERIC ELECTIVE COURSES

FOR BSc CHEMISTRY PROGRAMME

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

ANNEXURE (i)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce anddisseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region's intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

ANNEXURE (ii)

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO 1.Critical Thinking:

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The syllabus is prepared based on an interdisciplinary approach and aim to provide the students a deep understanding of the basic concepts of chemical sciences by acquiring the knowledge of terms, facts, concepts, processes, techniques and principles of the subject. It attempts to equip the students to cater to the industrial needs and to utilise them in the utmost practical manner.

The updated syllabus is preparedbased on Kannur University Regulations for Choice Based Credit and Semester System for Under-Graduate Programme 2019" (in OBE – Outcome Based Education – system) (KUCBCSSUG 2019) with a view to implement outcome based education (OBE) and curriculum from the academic year 2019 -20 onwards as proposed by higher education agencies .

An OBE curriculum means, starting with a clear picture of what is important for students to be able to do, then organizing the curriculum, instruction and assessment to make sure this learning ultimately happens.Intended learning outcomes (POs, PSOs and COs) which specify what graduates completing BSc Chemistry programme are expected to know, understand and be able to do at the end of their programme of studywere discussed at various stages in three day OBE workshop conducted by KSHEC Trivandrum associated with Kannur University. These learning outcomes(POs,PSOs and COs) were further discussed along with content of the syllabus and assessment methods at the workshops conducted for faculty members and other stakeholders for restructuring curriculum by Kannur University and finalised after consulting with intellectuals, academicians, faculty members , researchers and students

The B Sc degree programme in Chemistry designed for students to attainthe intended learning outcomes which specified as PSOs(Programme Specific Outcome) and COs(Course Outcome)are clearly stated in the syllabus.

The mission and vision statements and PO statements of the University were givenat the beginning of the syllabus and PSO statements before the scheme of the syllabus .The CO statements are givenin the beginning of each of the courses. Teachers need to aware these statements as these describe the desired educational accomplishments of the degree programs.The reference materials have been recommended after a thorough study. The revised course pattern, distribution of credits, scheme of evaluation and syllabus approved by the board are given.

There are many personalities whose support and guidance made this restructured syllabus a reality. I express my profound gratitude to the members of the Board of Studies (UG) in Chemistry who provided me extensive personal and professional support during the work of restructuring this syllabus. With immense pleasure and gratitude I remember the untiring support rendered by the faculty members of Chemistry from various Colleges of Kannur University,academic community and all other stake holderswho worked for preparing this restructured syllabus and curriculum.

Saheed VK

Chairperson

Board of Studies, Chemistry(UG) ,Kannur University.

Kannur University

BSc Chemistry Programme

Programme Specific Outcomes (PSOs)

After successful completion of three year degree program in Chemistry a student should be able to;

PSO 1 Understand the fundamental concepts, principles and processes underlying the academic field of chemistry, its different subfields (analytical, inorganic, organic and physical), and its linkages with related disciplinary areas/subjects;

PSO 2 Demonstrate procedural knowledge that creates different types of professionals in the field of chemistry and related fields such as pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.;

PSO 3 Employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact of chemistry on the environment and the society.

PSO 4 Use chemical techniques relevant to academia and industry, generic skills and global competencies, including knowledge and skills that enable students to undertake further studies in the field of chemistry or a related field, and work in the chemical and non-chemical industry sectors.

PSO5 Undertake hands on lab work and practical activities which develop problem solving abilities required for successful career in pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.

PSO 6 Understand safety of chemicals, transfer and measurement of chemical, preparation of solutions, and find out the green route for chemical reaction for sustainable development.

PSO 7 Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

COURSE STRUCTURE FOR CHEMISTRY (UG) PROGRAMME
2019 ADMISSION

SEMESTER I

No.	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course I	5	4	10	40	50
2	English Common Course II	4	3	10	40	50
3	Additional Common Course I	4	4	10	40	50
4	Core Course 1 (Theoretical & Inorganic Chemistry)	2	2	10	40	50
5	Core Course 2 Practical I Part 1	2	-	-	-	-
6	ComplementaryElective -I (Course I)	2	2	8	32	40
7	Complementary Elective Practical	2	-	-	-	-
8	Complementary Elective -II (Course I)	4	3	10	40	50
	Total	25	18	58	232	290

SEMESTER-II

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course III	5	4	10	40	50
2	English Common Course IV	4	3	10	40	50
3	Additional Common Course- II	4	4	10	40	50
4	Core Course 3 (Analytical and Inorganic chemistry– I)	2	2	10	40	50
5	Core Course 2, Practical I - Part 2	2	3	10	40	50
6	Complementary Elective – I (Course II)	2	2	8	32	40
7	Complementary Elective Practical	2	-	-	-	-
8	Complementary Elective -II (CourseII)	4	3	10	40	50
	Total	25	21	68	272	340

SEMESTER-III

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course V	5	4	10	40	50
2	Additional Common Course- III	5	4	10	40	50
3	Core Course4 (Organic Chemistry I)	3	3	10	40	50
4	Core Course 5 Practical 2,Part I	2	-	-	-	-
5	Complementary Elective -1(CourseIII)	3	2	8	32	40
6	Complementary Elective Practical	2	-	-	-	-
7	Complementary Elective -II (CourseIII)	5	3	10	40	50
	TOTAL	25	16	48	192	240

SEMESTER-IV

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	English Common Course VI	5	4	10	40	50
2	Additional Common Course- IV	5	4	10	40	50
3	Core Course 6(Organic Chemistry II)	3	3	10	40	50
4	Core Course 5 Practical 2,Part II	2	3	10	40	50
5	Complementary Elective -1(CourseIV)	3	2	8	32	40
6	Complementary ElectivePractical	2	4	8	32	40
7	Complementary Elective -II (CourseIV)	5	3	10	40	50
	TOTAL	25	23	66	264	330

SEMESTER-V

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	Generic Elective Course	2	2	5	20	25
2	Core Course 7 Analytical and Inorganic Chemistry-II	3	4	10	40	50
3	Core Course 8 (Inorganic Chemistry)	3	4	10	40	50
4	Core Course 9 (Physical Chemistry-I)	3	4	10	40	50
5	Core Course 10 (Physical Chemistry-II)	3	4	10	40	50
6	Core Course 11,Practical 3	5	-	-	-	-
7	Core Course 12, Practical 4	5	-	-	-	-
8	Core Course 13 Project/Industrial Visit	**1**	-	-	-	-
	TOTAL	25	18	45	180	225

SEMESTER-VI

No	Title of the Course	Hours /week	Credit	MARKS		
				CE	ESE	TOTAL
1	Core Course 14 (Organic Chemistry-III)	4	4	10	40	50
2	Core Course 15 (Physical Chemistry-III)	**4**	3	10	40	50
3	Core Course 16 (Physical methods In Chemistry)	3	3	10	40	50
4	Core Course 17 Discipline Specific Elective Course	3	3	10	40	50
5	Core Course 18, Practical 5	3	3	10	40	50
6	Core Course 11& 12 Practical 3& 4	7	6	10+ 10	40+ 40	50+ 50
7	Core Course 13 Project Industrial Visit	**1**	2	4	16+ 5	25
	TOTAL	25	24	74	301	375

First Complementary Elective –Physics, Second Complementary Elective-Mathematics

Total Credit 120

Total Marks 1800

Scheme of Mark distribution - B Sc Chemistry Programme

Course	No.of Papers	Marks per paper	Total Marks
English Common Course	6	50	300
Additional Common Course	4	50	200
ComplementaryElective Course -Physics	5(4 Theory +1Practical)	40	200
Complementary Elective Course -Mathematics	4	50	200
Core Course-Chemistry	17(12Theory +5Practicals)	50	850
Project	1	25	25
Generic Elective Course	1	25	25

Credit distribution - B Sc Chemistry Programme (Semester I to VI)

Programme	Sem.	Common*		Core	ComplementaryElective Course		Generic Elective Course	Total
		Eng	Addl	Chemistry	Mathematics	Physics		
BSc (Chemistry)	I	4+3	4	2	3	2		18
	II	4+3	4	2+3	3	2		21
	III	4	4	3	3	2		16
	IV	4	4	3+3	3	2+4		23
	V			4+4+4+4			2	18
	VI			4+3+3+3+3+3+3+2				24
	Total	22	16	56	12	12	2	120

Components of Core (Chemistry)

The core courses of BSc Chemisty Programme will consists of the following components.

- Theory
- Practical
- Project (Investigatory)
- Study tour (Visiting Factory/ science institute/laboratory).

Scheme of Core course (Chemistry)

No.	Semester	Course code	Title of the Course	Credits	Contact hr/week
1	I	1B01CHE	Theoretical and Inorganic Chemistry	2	2
2	II	2B03CHE	Analytical and Inorganic chemistry-I	2	2
3	II	1B02CHE/PCH & 2B02CHE/PCH	*Core Course Practical I Volumetric Analysis	3	2—I Sem 2—II Sem
4	III	3B04CHE/PCH	Organic Chemistry-I	3	3
5	IV	4B06CHE/PCH	Organic Chemistry-II	3	3
6	IV	3B05CHE/PCH & 4B05CHE/PCH	*Core Course Practicals 2 Inorganic Qualitative Analysis	3	2—III Sem 2—IV Sem
7	V	5B07CHE/PCH	Analytical and Inorganic chemistry-II	4	3
8	V	5B08CHE/PCH	Inorganic Chemistry	4	3
9	V	5B09CHE/PCH	Physical Chemistry- I	4	3
10	V	5B10CHE/PCH	Physical Chemistry- II	4	3
11	VI	6B14CHE/PCH	Organic Chemistry III	4	4
12	VI	6B15CHE/PCH	Physical Chemistry III	3	4
13	VI	6B16CHE/PCH	Physical Methods in Chemistry	3	3
14	VI	6B17CHE/PCH	Discipline Specific Elective Course	3	3
15	VI	5B11CHE/PCH 6B11CHE/PCH	*Core Course Practicals 3 Gravimetric Analysis	3	5—V Sem 4—VI Sem
16	VI	5B12CHE/PCH 6B12CHE/PCH	*Core Course Practicals 4 Organic Chemistry	3	5---V Sem 3---VI Sem
17	VI	6B18CHE/PCH	*Core Course Practicals5 Physical Chemistry	3	3
18	VI	5B13CHE/PCH 6B13CHE/PCH	Project & Industrial Visit	2	1—SemV 1---Sem VI

* External examination will be held at the end of II/ IV/VI semester

Scheme for Discipline Specific Elective Course

No	Semester	Course code	Title of the course	Contact hour/ Week	Credit
1	VI	6B17CHE/PCH-A	Environmental Chemistry	3	3
2	VI	6B17CHE/PCH-B	Applied Chemistry	3	3
3	VI	6B17CHE/PCH-C	Polymer Chemistry	3	3
4	VI	6B17CHE/PCH-D	NanoChemistry	3	3

Scheme forComplementaryElective Course (Chemistry)

No	Semester	Course code	Title of the course	Contact hour/ week	Credit
1	I	1C01CHE/PCH	Chemistry (For Physical & Biological Sciences)	2	2
2	II	2C02CHE/PCH	Chemistry (For Physical & Biological Sciences)	2	2
3	III	3C03CHE/PCH(BS)	Chemistry (For Biological Science)	3	2
4	III	3C03CHE/PCH(PS)	Chemistry (For Physical Science)	3	2
5	IV	4C04CHE/PCH(BS)	Chemistry (For Biological Science)	3	2
6	IV	4C04CHE/PCH(PS)	Chemistry (For Physical Science)	3	2
5	I,II, III&IV	4C05CHE*/PCH	ComplementaryElective Course practical	2	4

* External examination will be conducted at the end of IV semester.

Scheme of Generic Elective Course

The Generic Elective course is meant for all the students in the institution except the students of BSc Chemistry Programme. External examination will be conducted at the end of Vth semester.

Options available for Generic Elective course (Chemistry)

No	Semester	Course code	Title of the course	Contact hour/ week	Credit
1	V	5D01CHE/PCH	Chemistry in Service to man	2	2
2	V	5D02CHE/PCH	Drugs-Use & Abuse	2	2
3	V	5D03CHE/PCH	Environmental Studies	2	2
4	V	5D04CHE/PCH	Nanomaterials	2	2
5	V	5D05CHE/PCH	Chemistry in Every day life	2	2

Evaluation pattern

Mark system will be followed instead of direct grading for each question. For each course in the semester letter grade, grade point and % of marks are introducedin 7-point indirect grading system as per KUCBCSSUG 2019. Accordingly 20% of the total marks in each course are for internal evaluation and the remaining 80% for external evaluation.

Internal Evaluation (Core , Complementary Elective & Generic Elective)
Components with percentage of marks of Internal Evaluation of theory

Test papers-60%

Seminar/Viva-40%

Internal evaluation isconducted bythe concerned Department in mark system. Marks secured for internal evaluation need be send to University.

External Evaluation (Core , Complementary Elective & Generic Elective)
External assessment will include Theory, Practical and Project evaluation conducted by University after the completion of a semester. Duration of theory examination for Core &Complementary courses will be 3 hours, whereas for Generic Elective course is 2 hours. The practical examination for Core Course Practical I- Volumetric Analysis will be 3 hours and other Core &Complementary Elective practical exam will be of 4 hour duration.

Project work:

Project works will be carried out in fifth and sixth semesters. Not more than five students can form a group and undertake a project. Each individual student should submit a copy of the project report duly attested by the supervising teacher and Head of the department. The report has to be presented at the time of practical examination conducted at the end of VI semester for evaluation.

Study tour:

Students are required to visit a factory/Laboratory/Research Institute of repute during the course and have to submit the report of the study tour at the end of the sixth semester during the time of practical examination. No credit will be separately given for study tour report.

Practical record, Project report & Study tour report must be certified by the teacher in charge and countersigned by the Head of the Department. Students should submit certified record of respective practical work at the time of University practical examination.

Mark distributions

Table 1: Internal and External marks for Core (Chemistry) courses:

Item	Marks		Total
	Internal	External	
Theory	10	40	50
Practical	10	40	50
Industrial visit	--	5	5
Project	4	16	20

Table 2: Internal and External marks for ComplementaryElective Course (Chemistry)

Item	Marks		Total
	Internal	External	
Theory	8	32	40
Practical	8	32	40

Table 3: Internal and External marks for Generic Elective Course (Chemistry)

Item	Marks		Total
	Internal	External	
Theory	5	20	25

Table 4: Distribution of Internal marks for Theory courses (Core, Complementary Elective & Generic Elective)

Seminar/Viva	40%
*Test paper	60 %

* At least two test papers are to be conducted and average of these two is to be taken for awarding mark.

Table 5: Distribution of Internal marks for Practical courses

Record + Lab involvement*	50%
Test papers/ Viva	50%

*On completion of each experiment, a report should be presented to the course teacher. It should be recorded in a bound note-book. The experimental description should include aim, principle, materials/apparatus required/used, method/procedures, and tables of data collected, equations, calculations, graphs, and other diagrams etc. as necessary and final results.

Table 6: Distribution of internal and external marks for Project

Internal (20% of Total)	%	External (80 % of total)	%
Punctuality	20 %	Relevance of Topic/Statement of Objectives and Methodology	20%
Use of data	20%	Presentation/Quality of analysis and findings	30 %
Scheme and Organization of report	30%	Viva Voce	50%
Viva Voce	30 %		

Distribution of Marks & type of questions for Core Course

<u>Marks including choice</u>:

Unit	Marks

Table 7. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

Distribution of Marks & type of questions for Complementary Elective Course
<u>Marks including choice</u>:

Unit	Marks

Table 8. Type of Questions & Marks for External Examination- ComplementaryElective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

Distribution of Marks for Generic Elective Course
<u>Marks including choice</u>:

Unit	Marks

Table 9. Type of Questions & Marks for External Examination –Generic Elective Course

	Total Questions	No. Of Questions to be Answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

Guidelines for the Evaluation of Projects

1.Evaluation of the Project Report shall be done under Mark System.

2.The evaluation of the project will be done at two stages:

a) Internal Assessment(supervising teachers will assess the project and award Internal Marks)

b) External evaluation (external examiner appointed by the University)

c) Marks secured for the project will be awarded to candidates, combining the Internal and External Marks

3. The internal to external components is to be taken in the ratio 1:4. Assessment of different components may be taken as below.

Internal(20% of total)		External(80% of Total)	
Components	% of internal Marks	Components	% of internal Marks
Punctuality	20	Relevance of the topic, Statement of Objectives Methodology (Reference/ Bibliography)	20
Use of Data	20	Presentation, Quality of Analysis/Use of Statistical tools, Findings and recommendations	30
Scheme/Organization of Report	30	Viva-voce	50
Viva-Voce	30		

4. Internal Assessment should be completed 2 weeks before the last working day of VIthsemester.

5.Internal Assessment marks should be published in the department.

6.Project evaluation shall be done in the VI semester along with practical exams.

7. Chairman Board of Examinations, may at his discretion, on urgent requirements, make certainexception in the guidelines for the smooth conduct of the evaluation of project.

2.PASS CONDITIONS-

1. Submission of the Project Report and presence of the student for viva are compulsory for internal evaluation. No marks shall be awarded to a candidate if she/he fails to submit theProject Report for external evaluation.

2. The student should get a minimum of 40 % marks of the aggregate and 40% separately for ESE and 10% CE for pass in the project.

3. In an instance of inability of obtaining a minimum of 40% marks, the project work may be re-done and the report may be re-submitted along with subsequent exams through parent department.

CORE COURSE: I - THEORETICAL AND INORGANIC CHEMISTRY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1	**1B01CHE**	**2**	**2**	**3**

Course outcome

On successful completion of this course, students should be able to

CO 1: Correlate the structure and behavior of atom

CO2: Differentiate the various chemical interactions in molecules through bonding concepts

CO3: Analyze and interpret the gradation in the properties of elements in the periodic table

CO4:Predict the nuclear transmutations

CO5: identify the role of radioactive materials in different applications

Contact hours-36

UNIT: 1 ATOMIC STRUCTURE AND INTRODUCTION TO WAVE MECHANICAL CONCEPT (12 hrs)

Bohr theory of atom – calculation of Bohr radius, velocity and energy of an electron. Atomic spectra of hydrogen . Limitations of Bohr theory- Classical mechanics – concept, failure. Black body radiation- Planck's law of radiation. Photoelectric effect- Heisensberg's uncertainty principle and its significance, dual nature of electrons – Davisson and Germer's experiment. - de Broglie hypothesis - Schrodinger wave equation (derivation not expected), - Postulates of quantum mechanics (brief study). Application of Schrodinger wave equation to particle in one dimensional box. – normalization of wave function. Quantum numbers - Shapes of orbitals - Aufbau, Pauli's and Hunds rule - Electronic configuration of atoms.

UNIT: 2 CHEMICAL BONDING (9hrs)

Ionic bond: General characteristics, types of ions-Factors effecting the formation of ionic compound - Lattice energy – Born- Lande equation with derivation - Madelung constant, Born Haber cycle and its application - Covalent bond - Valance bond theory and its limitations - Hybridization and shapes of simple molecules (BeF2, PCl3, SF6, CH4, CH3-CH3, CH2=CH2, CH□CH) - VSEPR theory – Shape of molecules and ions (NH3, XeF6, ClF3, NH4+, H3O+) - Molecular orbital theory - homodiatomic molecules and heterodiatomic molecules(HCl and NO)- LCAO method - Bond strength and bond energy -

Polarisation and Fajan's rule - Metallic bonding - Free electron and band theory- Fermi level, explanationsof metallic properties based on these theories - Weak chemical forces - Hydrogen bond andVander Waal's forces.

UNIT: 3 GENERAL PROPERTIES OF ELEMENTS (6hrs)

Modern periodic law -long form periodic table

Periodicity in properties – Atomic, ionic, covalent radii – ionisation potential,electron affinity, – Electronegativity – Paulings, Mulliken, Allred Rochow's andMulliken-Jaffe Scale of lectronegativity. Radius ratio – Effective nuclear change –Screening effect – Slater rules, Anomalous behaviour of 1st element of a group –diagonal relationship.

UNIT:4 NUCLEAR CHEMISTRY(9HRS)

Radioactivity - rate of radioactive disintegration –half life- Nature of radiation from radioactive elements – stability of nucleus-binding energy-magic numbers-packing fractions-n/p ratio. Detection and measurement of radioactivity - Gieger-Muller counter - Wilson cloud chamber. Radioactive tracers - Rock dating, Carbon dating - Artificial radio activity - Artificial transmutations of elements - cyclotrons - Induced radio activity - Q values of nuclear reactions - Nuclear reactors Nuclear fission and nuclear fusion - Classification of reactors - Breeder reactor - India'snuclear energy programme.

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1 B R Puri, L R Sharma, K C Kalia, *Principles of Inorganic Chemistry*, Milestone publishers, New Delhi.

2 J.D. Lee, *Concise Inorganic Chemistry*, 5th Edition, Oxford University PressN Delhi, 2008.

3 Cotton F.A. and Wilkinson, *Advanced Inorganic Chemistry*, Wiley IndianPvt.Ltd., 2008.

4 J.E. Huheey, *Inorganic Chemistry*, Derling Kindersley (India) Pvt. Ltd., 2006.

5 Shriver and Atkins, *Inorganic Chemistry*, W. H Freeman and Company, 2006.

6 Garry L. Milessler and Donald A. Tarr, *Inorganic Chemistry*, Prentice Hall,2003.

7 H.J.Arinikar *Essentials of Nuclear Chemistry*, 4th edition New AgeInternational, New Delhi, 1995.

8 J.B.Rajam *Atomic Physics*, S.Chand and Co.Pvt.Ltd, 1974.

9.Selecteds Topics in Inorganic Chemistry ,Dr.Wahid .U. Malik,Dr. G.D. tuli, Dr. R.D. Madan,S.Chand Publications

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks
I	19
II	17
III	10
IV	16

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE III : ANALYTICAL AND INORGANIC CHEMISTRY – I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B03CHE	2	2	3

Course Out come

On successful completion of this course, students should be able to

CO 1: Determine the error, standard deviation and relative standard deviation of analytical data.
CO 2:Understand statistical treatment of analytical data and the principles underlying volumetric titrations.
CO 3:Understand basic principles behind selective precipitation of cation.
CO 4: Summarize the characteristics of s- and p- block elements
CO 5: Compare the various concepts of acids and bases

Contact hours-36

Unit:I Theoretical Aspects of Analytical Chemistry (7hrs)

Terms used in evaluation of analytical data – significant figures – Rounding of the numerical expression – Errors – Ways to reduce systematic errors Precision and accuracy – Ways of expressing precisions –- Average deviation from the mean - Standard Deviation – Relative standard deviation – Reporting of analytical data- Statistical treatment of analytical data – Population and samples – Confidence limit- Test of significance – students t-test, f-test - Q test for rejecting data.

Unit:II Fundamentals of Volumetric Titrations and Qualitative Analysis(6hrs)

Titrimetric analysis – Fundamental concepts – mole, molarity,normality, molality, ppm, and ppb ,mole fraction–
primary standard – secondary standard -standard solutions – quantitative dilution –problems – theory of titrations involving acids and bases,theory of acid-base indicators, – Permangnometry,dichrometry-redox indicators,
iodometry-iodimetry. Indicators – theory of adsorption indicators – complexometric titrations- EDTA titarions-titration curves-
Metal ion indicators.
Applications of solubility product and common ion effect in the precipitation of cations – Interfering acid radicals and their elimination (oxalate, fluoride, borate,phosphate, chromate, arsenite and arsenate).

Unit:III Chemistry of Representative Elements (14hrs)

Hydrogen : Isotopes (separation method not needed) Ortho and para hydrogen. Hydrides and their classification.

Alkali and alkaline earth metals: Periodic properties of hydrides, oxides, halides,hydroxides and carbonates.

P block elements

Comparative study based on electronic configuration - periodic properties of Hydrides,Oxides, Halides, Carbides and Oxoacids. Inert pair effect.Metallic and non-metallic character- Acid-base properties of oxides. Exceptional behaviorof second period element in the following groups of elements-Group13 (B,Al,Ga,In andTl).

Group14 (C,Si,Ge,Sn and Pb) Group15 (N,P,As,Sb and Bi). Group16 (O,S,Se,Te and Po) and Group17 (F,Cl,Br and I).

Unit:IV Acids and Bases (9hrs)

Concepts of Lowry and Bronsted – Lux – Arrhenius concept, flood concept – The solvent system concept – The Lewis concept – Relative strength of Acids and Bases – Effect of solvent – Leveling effect –Effect of polarity and substituents – Hard and soft acids and bases – Pearsons concept –Bonding in hard–hard and soft–soft combinations – HSAB principle and its applications –Basis for hard- hard and soft–soft interactions.

Classification of solvents – characteristic properties of a solvent – study of liquid ammonia, liquid HF and H2SO4.

REFERENCES

1 G D Christian, *Analytical Chemistry*, John Wiley and Sons..

2 G.H. Jeffery, J. Bassett, J. Mendham, R.C. Denny, *Vogel's Text book of Quantitative Chemical Analysis*, 5th Edn., ELBS, 1989.

3 Vogel's *Text Book of Qualitative Analysis*

4 DA Skoog, DM West, *Analytical Chemistry, An Introduction*, 4th Edn., CBS Publishing Japan Ltd., 1986.

5 Puri, Sharma and Kalia, *Principles of Inorganic Chemistry*, Milestone Publishers and Distributors, 2008.

6 J.D.Lee, *Concise Inorganic Chemistry*, 5th edition , Oxford University Press, New Delhi 2008.

7 R.Gopal, *Inorganic Chemistry for undergraduates*, Universities press, India Pvt.Ltd, 2009.

8 P. L.Soni, *Text book of inorganic Chemistry*, S.Chand and Sons, 2007.

9 Shriver and Atkins, *Inorganic Chemistry*, W. H Freeman and Company, 2006.

10 Huheey J. E, *Inorganic Chemistry*, Prentice Hall 1993

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks
I	13
II	12
III	23
IV	14

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE IV: ORGANIC CHEMISTRY – I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1II	3B04CHE/PCH	3	3	3

Course Outcome

On successful completion of this course, students should be able to

CO:1) Explain the types of electron displacement in organic moleculesand predict the propertiesof molecules based on electron displacement effect

CO:2) Distinguish aromatic , anti aromatic and nonaromatic compounds and ions and analyse the mechanistic details of aromatic electrophylic substitution

CO:3) Classify stereo isomers, understand the property of chirality , apply CIP rules to recognize the configuration and explain the stabilityof conformations drawing energy profile diagram

CO: 4) Explain the mechanism of polymerization, synthesis and application of industrially important Polymers

CO: 5) Explain the classification and the methods of preparation of important dyes

CO: 6) Illustrate the preparative methods and synthetic applications of important synthetic reagents

Contact hours-54

UNIT I- INTRODUCTION TO REACTION MECHANISM (12 HOURS)

Representation of structural formulae -Bonding notations - Drawing electronmovements with arrows- curved arrow notation

- Half headed and double headed arrows. Types of reagents – electrophiles and nucleophiles, Types of organic reactions,

Electronegativity- Polarity in bonds- Homolytic and Heterolytic bond fission - Reaction intermediates-Carbocations, Carbanions, Free radicals, Carbenes and Nitrenes - Their generation, Structure and stability. Methods of determination of reaction mechanism (product analysis, intermediates, isotope effects, kinetic and stereo chemical studies).

Electron displacement in organic molecules- inductive effect, Electromeric effect, Resonance or Mesomeric effect and Hyper conjugation- Steric effect- Tautomerism
Application of electron displacement effect in the order of acidity of Carboxylic acids, Phenol and Basicity of amines- Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine . - comparative basic strength of aniline, N- methylaniline and N,N-dimethyl aniline (in aqueous and non- aqueous medium), steric effects and substituent effects. Application of steric effect in the basicity of substituted aromatic amines -Explanation of Order of stability of carbonium ions, Free radicals ,carbanions, carbenes.

UNIT II-AROMATICITY (8 HOURS)

Structure of Benzene -Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. - ferrocene- Annulenes. Aromaticity in higher annulenes .Anti aromaticity and homoaromaticity.

Mechanism of aromatic electrophilic substitution-Halogenation, Nitration and Sulphonation - Friedel -Craft's alkylation and acylation—Orientation and reactivity in monosubstituted benzene rings- Ortho/para ratio.

UNIT III-STEREOCHEMISTRY: (15 HOURS)

Fischer Projection, Newman and Sawhorse Projection formulae and their inter-conversions; Geometrical isomerism: cis-trans and, syn-anti isomerism

*Optical Isomerism:*Optical activity: Definition, wave nature of light, plane polarised light, optical rotation and specific rotation, chiral centers. Chiral molecules: definition and criteria - absence of plane, center and Sn axis of symmetry – asymmetric and dissymmetric molecules. Examples of asymmetric molecules (Glyceraldehyde, Lactic acid, Alanine) and disymmetric molecules (trans-1,2-dichlorocyclopropane). optical isomerism in compounds without any stereo centers (allenes, biphenyls);

Molecules with constitutionally symmetrical chiral carbons (Tartaric acid) Molecules with constitutionally unsymmetrical chiral carbons (2,3-dibromopentane). D, L &, R, S configuration, Cahn-Ingold-Prelog rules.Racemic mixture, Racemisation and Resolution techniques. Geometrical isomerism with reference to alkenes and cyclo alkanes– cis, trans and E, Z configuration.

Conformational analysis :Definition and examples of conformational and configurational isomers.Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformation analysis of alkanes- Conformational analysis of ethane, n-butane, 1,2-dichloroethane,2-chloroethanol - Relative stability: Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms; Relative stability with energy diagrams., conformation of mono and disubstituted cyclohexane derivatives,

UNIT IV- POLYMERS : (6 HOURS)

Introduction and classification of polymers; Number average molecular weight, Weight average molecular weight, Polymerisation reactions -Addition and condensation -Mechanism of cationic, anionic and free radical addition polymerization; Ziegler-Natta polymerisation of alkenes; Preparation and applications of plastics - thermosetting (phenol-formaldehyde, Polyurethanes) and thermo softening (PVC, polythene –LDPE and HDPE) – polyamides, Polycarbonates, and silicone polymers. Rubbers - natural and synthetic: Buna-S, Chloroprene and Neoprene; Vulcanization; Polymer additives;
Introduction to liquid crystal polymers; Biodegradable and conducting polymers with examples.

UNIT V-DYES (5 HOURS)

Synthetic Dyes : Colour and constitution- Chromophores and auxochrome. Classification of dyes, Synthesis of Methyl orange, Malachite green, and Alizarin.Edible Dyes with examples

UNIT VI - SYNTHETIC REAGENTS (8 HOURS)

Active methylene group- Preparation and synthetic application of Ethyl acetoacetate, - Preparation and synthetic application of Aluminium isopropoxide, N-Bromo Succinamide , Diazo methane and Wittig reagent. Reformatsky reaction and its application

References

1. M. K. Jain and S. C. Sharma 'Modern Organic Chemistry', Visal Publishing Company Co.

2. K. S. Tewari and N. K. Vishnoi 'Organic Chemistry', Vikas Publishing House

3. B. S. Bahl 'Advanced organic Chemistry', S. Chand.

4. Peter Sykes, 'A Guide book to Mechanism in Organic Chemistry' , Pearson Education

5. P. S. Kalsi' 'Organic Reactions and their Mechanisms'' New Age International Publishers

6. R. T. Morrison and R. N. Boyd, 'Organic Chemistry', Prentice Hall of India

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8. Gowariker V.R., Viswanathan N.V. and Jayader Sreedhar,' Polymer Science', Wiley Eastern Ltd., New Delhi.

9. Billmeyer, F. W. Textbook of Polymer Science, John Wiley & Sons, Inc.4. Gowariker, V. R.; Viswanathan

Further Reading

1. P. Y. Bruice, 'Organic Chemistry', Pearson Education.

2. J. March, 'Advanced Organic Chemistry', John Wiley & Sons, NY

3. S. H. Pine 'Organic Chemistry', McGraw Hill

4. J. Clayden, N. Greeves, S. Warren and P. Wothers, 'Organic Chemistry', Oxford University Press

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks	Unit	Marks
I	15	V	5
II	10	VI	9
III	16		
IV	7		

Type of questions & Marks for External Examination

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE VI : ORGANIC CHEMISTRY – II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1V	4B06CHE/PCH	3	3	3

Course Outcome

On successful completion of this course, students should be able to

CO :1) Describe mechanisms for substitution and elimination reactions, and predict theeffect of nucleophile, leaving group, and solvent on the relative rates of S_N1 versus S_N2 reactions, and E1 versus E2 reactions, as well as on the relative rates ofsubstitution versus elimination.

CO 2) Explain Chugaev and Cope eliminations and E1CB mechanism

CO : 3) Illustrate the preparative methods and important properties of Hydro carbons,halogen compounds , Hydroxy compounds and Carbonyl Compounds

CO: 4) Explain the mechanism of important name reactions including rearrangements

involving hydroxyl and Carbonyl functional groups

Contact hours54

UNIT I- MECHANISM OF ORGANIC REACTIONS (12 HOURS)

Substrate and reagent- Electrophiles and nucleophiles- Aliphatic nucleophilic substitutions- mechanism of SN1,SN2- Stereo Chemistry of S_N1 and S_N2 reaction- Walden Inversion- Effect of nucleophile, leaving group, and solvent on the relative rates of S_N1 versus S_N2 reactions

Elimination - E1 and E2 mechanism - mechanism of dehydration of alcohol and dehydrohalogenation of alkyl halides - Saytzeff rule and Hofmann's rule.Effect of nucleophile, leaving group, and solvent on the relative rates of and E1 versus E2 reactions and on the relative rates substitution versus elimination.

E1CB mechanism- Thermal elimination reactions- Chaugaev and Cope elimination

Mechanism of Electrophilic addition of Hydrogen halides to Carbon- Carbon double bond-Markownikoff's rule - Kharasch effect (Free radical addition of HBr on unsymmetrical double bond)

UNIT 1I - HYDROCARBONS (14 HOURS)

Alkanes –Nomenclature , Preparation by Reduction of alkyl halides and Wurtz reaction and Kolbe's electrolytic method.
Alkenes - Nomenclature Preparation by dehydration of alcohols, dehydrohalogenation of alkylhalides, dehalogenation of vicdihalides and by Kolbe's electrolytic method.

Reactions- Hydrogenation, addition of halogens, halogen acid and water. Oxidation with KMnO4, $K_2Cr_2O_7$ and Osmium tetroxide, Ozonolysis and polymerization.
Alkynes- Nomenclature Preparation by dehydrohalogenation of vic-dihalides and gem-dihalides, dehalogenation of tetrahalides and Kolbe's electrolytic method. Reactions- Addition of Hydrogen, Halogen, Halogen acid and water – oxidation using alkaline $KMnO_4$, Acidic $K_2Cr_2O_7$ and Seleniumdioxide, Ozonolysis, hydroboration-oxidation and Polymerization reactions specific to alkynes.
Dienes- Nomenclature-Conjugated, cumulated and isolated dienes with example, preparation of 1, 3 butadiene-by dehydration of diols. Reactions of 1, 3 butadiene - 1,2 and 1,4 additions, polymerization.
Polynuclear Hydrocarbons- Haworth Synthesis of naphthalene, synthesis of Anthracene from benzyl chloride.

Cycloalkane – Nomenclature- Methods of formation, chemical reactions, Baeyer's strain theory and its limitations. Ring strain in small rings (cyclopropane and cyclobutane).

UNIT III - HALOGEN COMPOUNDS (5 HOURS)

Halogen compounds: Nomenclature - Alkyl and Aryl Halides:

Classes of alkyl halides, Methods of formation and chemical reactions of gem and vic-dihalides, Polyhalogen compounds : Methods of formation of Carbon tetrachloride and Chloroform.
Aryl Halides*Preparation:* (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions.Relative reactivity of alkyl, allyl /benzyl, vinyl and aryl halides towards nucleophilic substitution reactions., nucleophilic aromatic substitution; SNAr and Benzyne mechanism.

UNIT IV - HYDROXY COMPOUNDS (8 HOURS)

Alcohols – Nomenclature, Preparation of monohydric alcohols from carbonyl compounds using Grignard reagents - Preparation with hydro-boration reaction, Ascent and Descent in alcohol series, Methods to distinguish 1^o, 2^o and 3^o alcohols - Lucas method, Victor Meyer's method and oxidation method .

Glycerol- Isolation from fats and oils ,Preparation from Propene- Reactions – a) Oxidation b) Reduction with HI, c) Dehydration d) Nitration e) Acetylation
Phenols - Acidic character of phenol - Preparation of phenol from i) diazonium salt, ii) aryl sulphonates, iii) cummene. Important reactions of Phenol - Bromination, Kolbe-Schmidt reaction, Riemer-Tiemann reaction, Hauben-Hoesch reaction, Gattermann-Koch reaction ,

FeCl3 reaction.azo coupling.Naphthols- Preparation of Alpha and Beta Naphthols

Mechanism of following rearrangement reactions - a) Pinacol-Pinacolone rearrangement b) Fries rearrangement c) Claisen rearrangement.

UNIT V - CARBONYL COMPOUNDS (15 HOURS)

Nomenclature of aldehydes and ketones - Preparation of aldehydes and ketones - Rosenmund's reduction, Stephen's reduction, Etard's reaction, Oppeanauer oxidation, Houben - Hoesh synthesis. Reactions of aldehydes and ketones. Reduction using $LiA1H_4$ and $NaBH_4$ MPV,

Clemensen and Wolf-Kishner reduction. Reduction to pinacols - Oxidation using mild and strong oxidizing agents - SeO_2 oxidation -
Reaction with alcohols, KCN, sodium bisulphite and derivatives of ammonia - Distinction between acetaldehyde and benzaldehyde and acetaldehyde and acetone.

Mechanisms of Aldol and Benzoin condensation, Knoevenagel condensation, Claisan-Schmidt, Perkin, Cannizzaro and Wittig reaction, Beckmann and Benzil-Benzilic acid rearrangements

Addition reactions of unsaturated carbonyl compounds: Michael addition.

References

1. M. K. Jain and S. C. Sharma ‘Modern Organic Chemistry’ 3rd Edition, Visal Publishing Company Co.

2. K. S. Tewari and N. K. Vishnoi ‘Organic Chemistry’, 3rd Edition, Vikas Publishing House

3. B. S. Bahl ‘Advanced organic Chemistry’, S. Chand.

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7. Graham Solomons, T.W., Fryhle, C.B. & Snyder, S.A. *Organic Chemistry,* John Wiley & Sons (2014).
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Further Reading

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2. J. March, ‘Advanced Organic Chemistry’, John Wiley & Sons, NY

3. S. H. Pine ‘Organic Chemistry’, McGraw Hill

4. J. Clayden, N. Greeves, S. Warren and P. Wothers, ‘Organic Chemistry’, Oxford University Press

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks	Unit	Marks
I	14	V	16
11	15		
III	5		
1V	12		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE VII : ANALYTICAL AND INORGANIC CHEMISTRY-II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B07CHE/PCH	3	4	3

Course Outcome

On successful completion of this course, students should be able to

CO: 1 Understand the qualitative and quantitative aspects of analysis and separation techniques
CO: 2 Explain instrumentation and working principle of different analytical techniques –TGA, DTA and radio chemical method of analysis.
CO: 3 Familiarize with the preparation, properties and uses of some inorganic compounds like hydrides of boron, sulphur and silicon based inorganic polymers and understand their importance
CO :4Explain the classification of refractories.
CO :5Knowthe position, electronic configuration and physical properties of noble gases and explain hybridization and geometry of different xenon compounds
CO :6Explain various steps involved in metallurgical operations and power metallurgy and understand Corrosion, theories of Corrosion and factors affecting Corrosion

SEMESTER V
ANALYTICAL AND INORGANIC CHEMISTRY-II

Contact hours:54

Unit: I -Principles of Gravimetric Analysis and Separation-Chemistry. (9hrs)

Gravimetric analysis – unit operations in gravimetric analysis.

. **Precipitation**: Conditions of precipitation – co precipitation and post precipitation

Principle of gravimetric estimation of iron and nickel

Chromatography -Basic principle, Column chromatography – Adsorption column chromatography and Partition column chromatography - Ion exchange chromatography -Ion exchange resins.

Thin layer chromatography--preparation of chromatoplate- running a thin layer chromatogram- location of spots.

Brief introduction on Gel chromatography and paper chromatography-

Solvent extraction: Principle – factors affectin solvent extraction- factors favouring solvent extraction different types-batch, continuous, counter current

Unit: II- Instrumental Techniques in Analytical Chemistry (9hrs)

Thermogravimetric analysis – introduction – instrumentation – factors affecting TGA – application of TGA. Differential thermal analysis – introduction – instrumentation – principle of working – factors affecting DTA – application. Thermometric titrations – a brief study.

Radio chemical methods of analysis – introduction – activation analysis – a brief study.

Neutron diffraction – theoretical aspects – thermal neutron – instrumentation – application.

Unit: III- Industrially important Inorganic compound (9hrs)

Structure ,properties and uses of:

Hydrides of boron – B_2H_6 and B_4H_{10}(preparation also). Borazine, Boric acid, oxoacids of halogens,

Inter halogen compounds, Pseudo halogens, Fluorocarbons.

Inorganic polymers

Phosphorous based, sulphur based and silicon based - silicones and silicates - polymers.

Refractories

Introduction- classification- super refractories - silicon carbide.Pure oxide refractories.

Unit: IV-Chemistry of Noble Gases(9hrs)

Discovery of noble gases. Electronic configuration and position in the periodic table. General physical properties, uses of noble gases. Compounds of noble gases– Clathrates, compounds of Xenon—XeF_2, XeF_4, XeF_6, XeO_2F_2 , $XeOF_2$, $XeOF_4$ and XeO_3. hybridization and geometry of these compounds. Fluorides of Krypton and Radon.

Unit: V- Metallurgy(9hrs)

Occurrence of metals.Various steps involved in metallurgical processes. Electrometallurgy, Hydrometallurgy.

Coinage metals-Occurrence and extraction of copper, silver and gold.

Powder metallurgy(brief discussion). Alloy steels- composition of alloy steels-application of alloy steels. Heat treatment of steel. Nonferrous alloys and their uses.

UNIT VI .Corrosion and corrosion control (9hrs)

Introduction..Causes of corrosion.types and Theories of corrosion-(Direct chemical attack or dry corrosion. Electrochemical theory or wetcorrosion. Peroxide theory,acid theory ,oxide theory) .Differential Aeration or concentration cell corrosion.

Factors influencing corrosion- nature of the metal- nature of the environment.Corrosion control.

References :

1.B R Puri, L R Sharma, K C Kalia, *Principles of Inorganic Chemistry,*Milestone publishers, New Delhi.

2. D A Skoog, D M West and S R Crouch, *Fundamentals of Analytical Chemistry,* 8th Edition, Brooks/Cole Nelson (Chapter 12-17).

3. Vogel's *Text Book of Quantitative Chemical Analysis*, 6th Edition,Peasons education limited.

4. Vogel's *Text Book of Qualitative Analysis*

5. G D Christian, *Analytical Chemistry,* John Wiley and Sons..

6. J.D Lee, *Concise inorganic chemistry,* Blackwell Science, London

7. Jain & Jain, *Engineering Chemistry*, Dhanpat Rai Publishing Company.

8. Chatwal and Anand, *Instrumental methods of chemical analysis.*

9. A K Srivastava, P C Jain, *Instrumental approach to chemical analysis*. S Chand.

10.H. Kaur, *Instrumental methods of chemical analysis,* PragatiPrakashan, Meer

11. Emelus and Anderson, *Principles of Inorganic Chemistry.*

12. R. P. Budhiraja ,*Separation Chemistry* , Second edition, New age internationalpublishers

13. Dr. S.K.Agarwala and Dr. Keemtilal, *Advanced Inorganic Chemistry.*

14.B.K. Sharma, Industrial Chemistry

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks	Unit	Marks
I	11	V	10
II	11	VI	9
III	11		
IV	10		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE VIII : INORGANIC CHEMISTRY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B08 CHE/PCH	3	4	3

Course Outcome

On successful completion of this course, students should be able to

CO:1) Understand the behavior of transition and inner transition elements and explain the separation of lanthanides by ion exchange method andlanthanide contraction

CO: 2) Understand key features of co-ordination compounds and illustrate the theories of coordination complexes, stability of complexesand explain factors affecting crystal field splitting.

CO: 3) Explain biological functions of metal ions.

CO: 4) Familiarize new elements in periodic table and Understand recent developments in inorganicchemistry.

SEMESTER V

INORGANIC CHEMISTRY

Contact hours:54

UNIT I. TRANSITION AND INNER TRANSITION ELEMENTS.(14hrs).

General properties of transition elements – Electronic configurations,Oxidation states, colour, magnetic properties, tendency to form complexes and catalytic properties.

Comparison of first transition series with second and third series.

Lanthanides – Occurrence , separation by ion - exchange chromatography. Electronic configurations, oxidation states, magnetic properties and spectra of lanthanides. Lanthanide Contraction—causes and consequences.

Actinides : Electronic configurations, oxidation states, spectra and magnetic properties.Trans actinide elements – Preparation, IUPAC nomenclature.

Comparison of transition and inner transition elements

UNIT II. COORDINATION CHEMISTRY- I (9hrs)

Introduction-Double salts and Coordination compounds.Nomenclature. Effective Atomic Number (EAN). Shapes of d orbitals.-Types of ligands.Chelates. Stereo chemistry of coordination compounds with coordination numbers 2 to 6. Isomerism. Stability of complex ions-stability constant. Factors affecting the stability of complexes. Application of complex formation in qualitative and quantitative analysis.

UNIT III.COORDINATION CHEMISTRY- II (9hrs)

Theories of bonding in transition metal complexes– Valence bond theory . Application to some complexes-Hybridization in tetrahedral, square planar and octahedral complexes – explanation of magnetic properties based on VBT. Limitations of VBT. Crystal field theory-Crystal field splitting in octahedral, tetrahedral and square planar geometries. Factors affecting the magnitude of crystal field splitting. Crystal field stabilization energy(CFSE). Explanation of colour, spectral and magnetic properties . Spectrochemical series.

UNIT IV. BIOINORGANIC CHEMISTRY(9hrs)

Myoglobin and Haemoglobin - Structure and functions of haemoglobin and myoglobin. Cooperativity effect.Bohr effect,. Metallo enzymes of

iron and zinc (structural details not needed). Metal ion transport across cell membrane – sodium/potassium pump. Biological functions of Co, Mn, Zn,Mg and Ca and toxicity of -,As, Cd, Pb, Hg .Biological fixation of nitrogen.

UNIT V. ORGANOMETALLIC COMPOUNDS (9hrs)

Introduction. Classification based on the nature of metal-carbon bond.

Preparation ,structure - valence bond theory - of mononuclear (Ni,Fe), binuclear (Fe,Mn,Co) and trinuclear (Fe) metal carbonyls - Application of 18 electron rule to predict M-M bond.

Preparation, properties, structure and bonding of Ferrocene.

UNIT VI . RECENT ADVANCES ININORGANIC CHEMISTRY (4Hrs)

New elements in periodic table **:**Elements with atomic numbers-113,115,117,118. -Note on discovery and naming of these elements

Elementary idea on : Graphene and borophene - Shape memory alloys- Mxenes- geopolymers.

REFERENCES

1. D. F. Shriver and P.W. Atkins, Inorganic Chemistry 3rd edn., Oxford University Press.
2. R. C. Mehrothra and A. Singh, Organometallic chemistry, New age publishers.
3. J. E. Huheey, E. A. Keiter, R. L. Keiter, O K Medhi, Inorganic Chemistry, Pearson.
4. B. R. Puri, L. R. Sharma, K. C. Kalia, Principles of Inorganic Chemistry, Milestone Publishers, New Delhi.
5. F. A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry 5th edn., John Wiley, New York.
6. J. D. Lee, Concise Inorganic Chemistry 5th edn., Blackwell Science, London.
7. R.A. Mackay, W. Henderson, Introduction to Modern Inorganic Chemistry, 6th edition . Nelson Thornes Ltd.

Internet links for reference:

1.https://iupac.org/iupac-is-naming-the-four-new-elements-nihonium-moscovium-tennessine-and-oganesson/

2. https://iupac.org/wp-content/uploads/2016/06/Press-Release_Naming-Four-New-Elements_8June2016.pdf

3. http://www.rsc.org/periodic-table/

4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4922135/

5. https://phys.org/news/2018-12-borophene-advances-d-materials-platform.html

6. https://www.geopolymer.org/science/introduction/

7. https://nano.materials.drexel.edu/research/synthesis-of-nanomaterials/mxenes/

8. https://ceramics.org/ceramic-tech-today/basic-science/research-on-mxenes-expandand-so-do-the-mxenes

9. https://www.sciencedirect.com/topics/materials-science/shape-memory-effect

Distribution of Marks for External Examinations

<u>Marks including choice</u>:

Unit	Marks	Unit	Marks
I	15	V	10
II	11	VI	2
III	13		
IV	11		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE IX : PHYSICAL CHEMISTRY I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B09 CHE/PCH	3	4	3

Course outcome

On successful completion of this course, students should be able to

CO1)Recognize and relate the properties of ideal and real gases

CO2) Describe the properties of liquids.

CO3) Identify and distinguish the types of solutions

CO4) Explain colligative properties of dilute solution and determine the molecular weight of a solute

CO 5) Identifydifferent crystallographic systems and various types of crystal defects

CO 6) Describe X ray diffraction to explain internal structure of solids

Contact hrs 54

UNIT 1 The Properties of Gases (15 hrs)

Gas laws – The general gas equation– The Kinetic model of gases – gas laws from the kinetic theory of gases ---Molecular Speeds – Maxwell's distribution of molecular speeds – Most probable velocity, average velocity and root mean square velocity — Collision diameter – Mean free path, Collision number and collision frequency – Degrees of freedom of a gaseous molecule – Principle of equipartition of energy and contribution towards heat capacity of an ideal gas.
Real gases – Molecular attractions – The compressibility factor – virial equation of state – Van der waals equation expressed in virial form – calculation of Boyle's temperature – Isotherm of real gases and their comparison with Van der waals isotherms – continuity of states – critical phenomenon – critical constants of a gas and its determination,derivation of relationship with vander waal constants.
–Determination of molecular mass by limiting density method – Principle of corresponding states – Liquefaction of gases by Joule Thomson effect.

UNIT 2 Liquid State (7hrs)

Theories of Liquids state, Vacancy Theory and Free volume theory- Properties of liquids– vapour pressure, Heat of vapourisation, Trouton's Rule ,Surface tension and its determination by capillary rise method and by using stalegnometer – Interfacial tension – surface active agents –effect of temperature on surface tension- Parachor and its applications – Viscosity - determination of coefficient of viscosity and its variation with temperature – refractive index – specific and molar refraction – Measurement of refractive index – Abbe's refractometer – optical activity and its measurement using Polarimeter.

UNIT 3 Solid State (16 hrs)

Amorphous and crystalline solids – Laws of crystallography – Law of constancy of interfacial angles – Law of constancy of symmetry – Law of rationality of indices – space lattice and unit cell – Miller indices –seven crystallographic systems – Bravais lattices – Spacing of lattice planes in simple cubic, body centred and face centred cubic systems – Number of particles per unit cell in each of these - Calculation of Avogadro number, density and molecular mass from crystallographic data. Determination of internal structure of crystals by X-ray diffraction methods – derivation of Bragg's equation – Bragg's rotating crystal method and De bye Scherrer Powder diffraction method – Crystal structure of NaCl – anomalous nature of diffraction pattern of KCl. Co-ordination Number – Efficiency of packing – Cubic and Hexagonal packing – Radius ratio rule – Tetrahedral and Octahedral voids. Liquid crystals – types – Examples – applications . crystal defects-point defects-Schottky and Frenkel defrcts-non stoichiometric defects.

UNIT 4 Solutions (16 hrs)

Types of solutions and methods for expressing concentration – Liquid systems — Completely miscible- Ideal and non- ideal solutions – Raoult's Law – Vapour pressure – composition diagrams-Azeotropic mixtures– Temperature – composition curves – Partially miscible liquids – Upper and Lower Critical solution temperature –Immiscible liquids – Steam distillation – Molar mass from steam distillation –
Dilute Solutions Colligative properties – Lowering of vapour pressure and Raoult's law – Calculation of molar mass. Elevation of boiling point – relation to lowering of vapour pressure – Thermodynamic derivation – Calculation of molar mass –Depression of freezing point – Thermodynamic derivation – Calculation of molar mass – Measurement by Beckmann's method – Osmotic pressure – Measurement by Berkely and Hartley's method – Laws of Osmotic pressure – Van't Hoff equation – Calculation of molar mass – Abnormal molar mass – Van't Hoff factor – Degree of dissociation and association and their calculation from colligative properties. Gas Liquid system — Henry's Law

References

1. Physical Chemistry : P.W. Atkins, Oxford University Press

2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.

3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.

4. A Textbook of Physical chemistry: K. L. Kapoor, Volume 1, Macmillan India Ltd
5. Text book of Physical Chemistry : Samuel Glasstone, McMillan Press Ltd.

6. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.

7. Physical Chemistry: W.J. Moore, Orient Longmans.

8. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company

9. Solid state chemistry and its applications-Antony. R .West

10. Solid state chemistry by Lesley E. Smart and Elaine A. Morre

11. Introduction to solids Leonid V Azaroff

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks
I	17
II	9
III	18
IV	18

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

CORE COURSE X : PHYSICAL CHEMISTRY II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B10 CHE/PCH	3	4	3

Course outcome

On successful completion of this course, students should be able to

CO 1) Identify the fundamental concepts of thermodynamics

CO2) Relate and Interpret the various laws of thermodynamics

CO3) Understand the concept of entropy and how the whole universe is related to it.

CO 4) Construct phase diagrams and study the equilibrium exists between various states of matter.and apply principles phase diagram to separation processes and for property modification of different type of system.

CO 5) Understand basic principles of surface chemistry and its application in various fields

CO 6) Correlate the types of colloids with its properties and to explore the applications in day todaylife.

Contacthrs54

UNIT 1 Thermodynamics-I (15hrs)

Basic concepts -- study of terms -- system and surroundings -- open, closed and isolated systems,isothermal,isochoric – adiabatic systems- state and state variables -- macroscopic properties – intensive and extensive properties – isothermal, adiabatic, isochoric and isobaric processes -- reversible and irreversible processes – work , heat and energy – state functions and path functions – exact and inexact differentials with notations – internal energy and enthalpy –-- zeroth law of thermodynamics –concept of temperature. statement of first law of thermodynamics – conservation of energy
– expansion work – general expression for work – work done during free expansion, expansion against constant pressure and isothermal reversible expansion – Heat capacity of gases at constant volume Cv and constant pressure Cp – relation between Cp and Cv and its derivation – P, V,T relations during adiabatic process -- work done during reversible adiabatic expansion-comparison for isothermal and adiabatic process -- Change in enthalpy at constant pressure -- Joule Thomson effect -- internal pressure -- inversion temperature.
Thermochemistry – standard enthalpy changes for physical and chemical changes –enthalpy of neutralisation,transition,formation,phase changes,combustion and solution- heats of reaction at constant volume qv and constant pressure qp – relation between qp and qv – Hess's law and its

applications –bond energy calculations-variation of enthalpy change of a reaction with temperature – Kirchoff equation.

UNIT 2 Thermodynamics –II(12hrs)

Limitations of first law – cyclic process – Carnot cycle – efficiency of heat engine – statement of second law of thermodynamics in terms of work and heat-Clausius,Kelvin Planck statement-concept of entropy -- physical significance of entropy (microscopic)– variation of entropy of ideal gases with pressure and temperature – second law in terms of entropy – entropy change for phase transitions – criteria for spontaneous changes-for isolated system at costant (T&V), (T&P), (S&V), (S&P)– Gibbs and Helmholtz free energies – condition of spontaneity in terms of free energy – comparison of entropy and free energy – Gibbs- Helmholtz equation – Maxwell relations

– Partial molar properties – concept of free energy – Gibbs Duhem equation – variation of chemical potential with temperature and pressure ..Chemical potential of a component in a mixture of ideal gases—Clapeyron equation- Clausius- Clapeyron equation for all phase equilibria-concept of fugacity.

Third law of thermodynamics—Nernst heat theorem – absolute entropy – calculation of absolute entropies.

UNIT 3 Chemical Equilibrium(8 hrs)

Law of mass action-equilibrium constant – Relation between Kp, Kc and Kx –Thermodynamic treatment of the law of mass action – Vant Hoff reaction isotherm –Temperature dependence of the equilibrium constant – The Van't Hoffs isochore– Pressure dependence of the equilibrium constant Kp– Study of heterogeneous equilibria – Factors that

change the state of equilibrium – Le –chatelier’s principle and its application to chemical and physical equilibria. Mention homogeneous gaseous equilibria having zero, positive and negative values of Δn. Calculation of degree of dissociation and Kp. Heterogeneous equilibria – Dissociation of solid calcium carbonate and decomposition of solid NH_4HS.

UNIT 4 Phase Rule (10 hrs)

Statement of phase rule and explanation of terms (component,degree of freedom,phase)-thermodynamic derivation - one component systems – water system and sulphur system (including meta stable equilibrium)- two component systems – reduced phase rule --- simples eutectic systems—lead-silver system --- desilverisation of lead--- KI –water system --- freezing mixtures--- systems involving the formation of compounds with congruent and incongruent melting points.—ferric chloride water system and Na_2SO_4 water system..—solid-gas equilibria --- decomposition of $CuSO_4.5H_2O$.—deliquescence and efflorescence.. Nernst distribution law..thermodynamic derivation and derivation from phase rule. Limitations--- modifications under special conditions.—applications of distribution law to study association and dissociation of salts, solvent extraction, hydrolysis of salts and equilibrium constant of the reaction $KI + I_2 = KI_3$.

UNIT 5 Colloids, Surface Chemistry (9 hrs)

Colloids, Classification – preparation – structure and stability – The electrical double layer –Zeta potential (no derivation)– Properties of Colloids – Tyndall effect – Brownian movement– Coagulation of colloidal solution – Hardy – Schulze rule – Flocculation value – Electro kinetic properties – Electrophoresis – Electro-osmosis – Protective colloids – Gold number -Emulsion –

Oil in water emulsion and water in oil emulsion – Emulsifying agents – Gels –Micelles-CMC-Donnon membrane equilibrium (basic idea only)
Physical and chemical adsorption – Adsorption isotherms – Freundlich adsorption isotherm – effect of temperature on adsorption – Langmuir adsorption isotherm -thermo dynamic derivation – use and limitation.B.E.T.equations (B.E.T. no derivation) – Gibbs adsorption equation(no derivation)-Surface films - Determination of surface area using Langmuir equations.

References

1. Physical Chemistry : P.W. Atkins, Oxford University Press
2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.
4. A Textbook of Physical chemistry: K. L. Kapoor, Volumes 2 &3, Macmillan India Ltd
5. Text book of Physical Chemistry : Samuel Glasstone, McMillan Press
6. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.
7. Physical Chemistry: W.J. Moore, Orient Longmans.
8. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company.
9.Chemical Thermodynamics: J.Rajaram and J.C.kuriacose,Pearson.
10.Physical Chemistry: A Molecular Approach by Donald A Mc Qurrie
11. Physical chemistry by G W Castellan.

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks	Unit	Marks
I	17	V	10
II	14		
III	9		
IV	12		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

CORE COURSEXIV: ORGANIC CHEMISTRY - III

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B14CHE/PCH	4	4	3

Course Outcome

On successful completion of this course, students should be able to

CO1 Acquaint with the classification, structures and properties of carbohydrates,explain the configuration of glucose and fructose, their inter conversion , illustrate Killiani-Fischer synthesis and Ruff degradation

CO2 Illustrate the preparative methods and the properties of different classes of organic acids , nitrogen containing compounds and heterocyclic compounds .

CO3Classify amino acids and peptides and explain the synthesisof simple peptides by *N*-protection (t-butyloxycarbonyl and phthaloyl) &C-activating groups and Merrifield solid-phase synthesis.Explain the methods of determination of primary structure of peptides

CO4 Distinguish the components of nucleic acids and lipids and their roles in biological system and the biological importance of various natural products .Familiarise with important drugs and their therapeutic applications

CO 5Recognisethe types and characteristics of pericyclic reaction and analyse the pericyclic reactions by FMO methods. Understand the photochemistry of carbonyl compounds

CO 6Understand the principles of Green Chemistry and the importance of green synthesis and recognize the impact of green chemistry on human health and the environment

72 HOURS

UNIT 1 CARBOHYDRATES (12 HOURS)

Occurrence, classification and functions of carbohydrates. Monosaccharide : Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversion of Monosaccharides: Aldopentose to Aldohexose (Arabinose to D- Glucose, D-Mannose) (Kiliani - Fischer method). Epimers, Epimerisation – Aldohexose to Aldopentose (D-Glucose to D- Arabinose) by Ruff degradation. Aldohexose to Ketohexose [(+) Glucose to (-) Fructose] and Ketohexose to Aldohexose (Fructose to Glucose)

Structure of disaccharides (sucrose, maltose, lactose) and polysaccharides (starch and cellulose) excluding their structure elucidation.Colour tests for carbohydrates

UNIT II -CARBOXYLIC ACIDS (7 HOURS)

Carboxylic acids - Nomenclature - Preparation and reactions of acrylic and crotonic acids. Preparation and reactions of Hydroxy acids - lactic acid, tartaric acid and citric acid. Dicarboxylic acids - Preparation and reactions of malonic, succinic, maleic and fumaric acids - Blanc's rule. Preparation and reactions Aromatic acids - Benzoic acid, Pthalicacids, anthranilic acid, salicylic acid, cinnamic acid

UNIT III - NITROGEN CONTAINING COMPOUNDS- (9 HOURS)

Nitro compounds – Nomenclature , General methods of preparation- (From alkane, alkyl halides,and halogeno carboxylic acid) . Preparation of Nitro benzene, Reduction, Electrophylic substitution, Nucleophylic substitution.

Cyanides and isocyanides- Nomenclature - General methods of preparation.

Amines –Preparation – From Alkyl halide, Nitro Compounds, Nitriles, Hoffman Bromamide reaction, Curtius reaction, Schmidth reaction, reduction of Alkyl isocyanide, Preparation of tertiary amine.

Chemical reaction- Acylation, Benzoylation, Diazotisation, Reactions of diazoniumsalt, Carbyl amine reaction, Hoffman's exhaustive methylation , Hoffman's elimination ,Mannich reaction, Ring substitution, Separation of mixture by Hinsberg method , Hoffmans tests for amine.

UNIT IV AMINO ACIDS, PROTEINS AND NUCLIC ACIDS (12 HOURS)

Classification of amino acids-α-Amino Acids - Synthesis - Gabriel, Strecker and Erlemeyer synthesis, ionic properties and reactions. Zwitterions, pK_a values, isoelectric point and electrophoresis;

Overview of Primary, Secondary, Tertiary and Quaternary Structure of proteins. Determination of Primary structure of Peptides by degradation - Edman degradation (N-terminal) and C–terminal (thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (upto dipeptides) by *N*-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid-phase synthesis.Denaturation of proteins.

Components of nucleic acids, Nucleosides and nucleotides;

Structure of: Adenine, Guanine, Cytosine, Uracil and Thymine;.synthesis of Adenine and thymine . Structure of DNA (Watson-Crick model) and RNA (types of RNA), Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation.

UNIT V INTRODUCTION TO NATURAL PRODUCTS (6 HOURS)

Alkaloids- Introduction- Properties and structure of Coniine, Nicotine and Quinine- Structural elucidation of Nicotine.Medicinal importance of Nicotine, Quinine, Morphine, Cocaine, and Reserpine.

Steroids- General characteristics and structure of cholesterol, Testosterone and Oestrone.

Vitamin- Water soluble and fat soluble vitamins . Synthesis of Vitamin C

Terpenes- Definition- Isoprene rule- Occurrence, isolation and structural elucidation of Citral

- natural rubber

Lipids : Introduction to oils and fats; common fatty acids present in oils and fats, Hydrogenation of fats and oils, Saponification value, acid value, iodine number.

UNIT VI HETEROCYCLIC COMPOUNDS (7 HOURS)

Classification and nomenclature, Structure and aromaticity in 5-numbered and 6-membered rings containing one heteroatom - Peparation, properties and structure of the following compounds- Pyrrole, Pyridine, Indole, Quinoline, Isoquinoline - Relative basic character of Pyrrole, pyridine and piperidine- Hofmann's exhaustive methylation of piperidine.

UNIT VII - PHARMACEUTICALCOMPOUNDS:(7HOURS)

Classification of drugs - Antibiotics- Discovery and importance, mode of action and examples- Misuse of antibiotics- antibacterial and antifungal agents- Sulpha drugs-mode of action-Importance- Examples and uses. Synthesis of Sulphacetamide.Antipyretics & analgesic and anti inflammatory agents - Mode of action. Narcotic and non narcotic analgesic, examples and uses. Synthesis of Paracetamol and Aspirin -Anti histamine-example. CNS Drugs – Synthesis of Phenobarbital , Psychoactive drugs – Hallucinogens, tranquillizers, Examples.

UNIT VIII PHOTOCHEMISTRY AND PERICYCLIC REACTIONS (7 HOURS)

Introduction to photochemistry- Photochemical reactions of carbonyl compounds - Norrish type I and II cleavages (Acyclic only)-Photo reduction of ketone

Concerted reactions, Molecular orbitals of ethene, 1,3-butadiene and allyl radical. Symmetry properties, HOMO, LUMO, Thermal and photochemical pericyclic reactions.Types of pericyclic reactions – electrocyclic, cycloaddition and sigmatropic reactions – one example each and their explanation by FMO theory.

UNIT IX GREEN CHEMISTRY (5 HOURS)

Need for Green chemistry - Goals of green chemistry - Limitations.

Twelve principles of green chemistry with their explanations and examples - Designing a green synthesis - Prevention of waste / byproducts - Atom economy (maximum incorporation of materials used in the process) - Minimization of hazardous / toxic products. Green synthesis - Microwave assisted reactions in water - Hoffann Elimination - Microwave assisted reaction in organic solvent - Diels Alder reaction, Ultrasound assisted reaction -Esterification, Saponification.Green chemistry in day to day life.

References

1. M. K. Jain and S. C. Sharma 'Modern Organic Chemistry', Visal Publishing Company Co.

2. K. S. Tewari and N. K. Vishnoi 'Organic Chemistry', Vikas Publishing House

3. B. S. Bahl 'Advanced organic Chemistry', S. Chand.

4. R. T. Morrison and R. N. Boyd, 'Organic Chemistry', Pearson Education.

5. I. L. Finar Organic Chemistry, Vol.- II, Pearson Education

6. M.S.Yadav, ‘Synthetic drugs’

7. V.K. Ahluwalia, M. Kidwai ‘New trends in Green Chemistry’, Anamaya Publishers.

8. V. Kumar, ‘Introduction to Green Chemistry’, Vishal Publishing House. Further Reading

Further reading

1. P. Y. Bruice, ‘Organic Chemistry’, Pearson Education.

2. J. March, ‘Advanced Organic Chemistry’, John Wiley & Sons, NY

3. S. H. Pine ‘Organic Chemistry’, McGraw Hill

4. J. Clayden, N. Greeves, S. Warren and P. Wothers, ‘Organic Chemistry’, Oxford University Press

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks	Unit	Marks	Unit	Marks
I	10	V	5	IX	4
II	6	VI	5		
III	8	VII	6		
IV	10	VIII	8		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be Answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSEXV: PHYSICAL CHEMISTRY - III

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B15CHE/PCH	4	3	3

Course outcome

On successful completion of this course, students should be able to

CO 1) Understand the mechanism of electrical conductance, theories of electrical conductance, and coductometric titrations

CO 2) Understand the basic principle of ionic equilibrium and its application in laboratories

CO 3) Design different types of electro chemical cell and able to calculate its potential.

CO 4) Familiarise with electro analytical methods

CO 5) Acquaint with kinetics of simple,complex, enzymatic and surface reactions

CO6) Understand basic principles of photochemistry and its application in spectrophotometry

Contact hours -72

UNIT 1 Electrical Conductance (16 hrs)

Mechanism of electrical conduction – Arrhenius theory – The laws of electrolysis – Faraday’s law and its significance – Transference Number – True and apparent transport numbers-Determination by Hittorf’s method and moving boundary method. Equivalent conductance and Molar conductance -Effect of Dilution on conductance – Effect of dielectric constants of solvents – Ionic mobilities – Kohlrausch’s Law – applications – Mobilities of Hydrogen and Hydroxyl ions – Diffusion and ionic mobility. Activity and activity coefficient – standard state ionic activities and activity coefficient – ionic strength – Debye – Huckel Theory – Ionic atmosphere – Debye – Huckel limiting law – Temperature dependence of ionic conductance-Debye-Falkenhagen effect-wein effect(definition only)- determination of solubilities by conductance measurements – conductometric titrations – conductance in non-aqueous solvents.

UNIT 2 Ionic Equilibria (10 hrs)

Ionic product of water – Dissociation constants of acids and bases – pH and its determination – Heat of neutralization – Incomplete neutralization – Hydrolysis of different types of salts – Degree of hydrolysis and hydrolytic constant – and its relation with pH and pOH – Buffer solution – pH of Buffer solution – Henderson’s equation – Buffer capacity – Application of buffer – Preparation of a buffer(one example)-Acid – base indicators –Theory of acid – base indicators.

UNIT 3 Electromotive Force (23 hrs)

Electrochemical cell-Daniell cell – Reversible and Irreversible cell – Single electrode potential – EMF of cells – Standard potential and standard emf – Standard Hydrogen electrode and calomel electrode – Types of electrodes – electrode reaction – cell reaction -Nernst equation for electrode potential and emf of the cell – Electrochemical series – IUPAC sign convention – Application of Gibb's Helmholtz equation to galvanic cells – Calculation of ΔG, ΔH, ΔS and equilibrium constant from emf data – The standard cells – Weston Cadmium cell and its emf. Concentration cells – Electrode and electrolytic concentration cells with and without transference and their emfs – Liquid junction potential – Elimination of liquid junction potential – salt bridge – application of potential measurements – Determination of solubility product, ionic product of water, transport number . pH determination – Hydrogen, Quinhydrone electrode and glass electrode –advantages and dis advantages.potentiometric titration – redox indicators — Fuel cells. (hydogen-oxygen, hydrocarbon-oxygen)
Polarography : Dropping Mercury Electrode, Polarization – Concentration polarization, Half wave Potential and Diffusion current (Significance), Ilkovic equation, Advantages of polarographic analysis – Applications.

UNIT 4 Chemical Kinetics (16 hrs)

The rates of chemical reactions – Experimental techniques – rate laws and rate constant – Order and molecularity of reactions – Methods of determining the order of reaction – Integrated rate laws of zero order, first order and second order reactions — General integrated rate equation for nth order reaction - Zero and fractional order reactions - Half life –types of complex reactions-consecutive parallel and opposing reactions-their derivation (first order only). Temperature dependence of reaction rates – Arrhenius equation – Interpretation of parameters – steady state approximation – Kinetics of unimolecular reactions –Lindemann's theory.Theories of reaction rates – collision theory – Derivation of rate equation for second order reaction from collision theory – thermodynamic approach of transition state theory – Entropy activation.Catalysis – Homogeneous and Heterogeneous catalysis – examples – Features of homogeneous catalysis – Enzymes – Michalis – menten mechanism. Heterogenous catalysis – Kinetics of unimolecular surface reactions– Langmuir isotherm– 2nd order surface reactions-Hinshelwood mechanism .

UNIT 5 Photo Chemistry (7hrs)

Photochemistry – consequences of light absorption – The Jablonski diagrams – Radiative and non radiative transition – Light absorption by solutions – Lambert – Beer Law – Laws of photochemistry – The Grotthus – Draper law – Stark – Einstein law – Quantum efficiency / Quantum yield – Experimental determination of quantum yield – High and low quantum yield - Photochemical rate law – Energy transfer in photochemical reactions – Photo sensitization-application in photosynthesis(brief idea only) - quenching – Chemiluminescence – Lasers. Colorimetry - Instrumentation of photocolorimeter -applications

References

1. Physical Chemistry : P.W. Atkins, Oxford University Press.
2. Physical Chemistry : Puri, Sharma and Pathania, Vishal Publishing Co.
3. A Text book of Physical Chemistry: A S Negi and S C Anand, New Age International Publishers.

4. A Textbook of Physical chemistry: K. L. Kapoor, Volumes 1 &5, Macmillan India Ltd
5. Advanced Physical Chemistry: Gurdeep Raj, Goel Publishing House, Meerut.
6. Physical Chemistry: W.J. Moore, Orient Longmans.
7. Physical Chemistry: N. Kundu & S.K. Jain, S.Chand & Company.
8. Physical Chemistry : K. J. Laidler, John H.Meiser,
9. Chemical Kinetics : K.J.Laidler, Pearson Education.
10. Physical Chemistry : P C Rakshit
11. Electrochemistry: Samuel Glasstone

Distribution of Marks for External Examinations

<u>Marks including choice</u>:

Unit	Marks	Unit	Marks
I	14	V	6
II	8		
III	20		
IV	14		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

CORE COURSEXVI: PHYSICAL METHODS IN CHEMISTRY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B16CHE/PCH	3	3	3

Course outcome

On successful completion of this course, students should be able to
CO 1 i) Explain the important principles of spectroscopy
    ii) Apply spectroscopic techniques in analyzing the structure of simple organic molecules
CO 2 Acquainting the working principles of various instruments and their functions
CO 3 Understand the basic principles of symmetry and group theory and its applications in chemistry
CO 4 Study the basic principles of nanochemistry and understand the various nanofabrication methods
CO 5 Explain the important principles for quantum chemical and molecular mechanic methods

of computing the geometry and energy of molecules

Contact hours-54

UNIT 1 Spectroscopy I (18 Hours)

Introduction: electromagnetic radiation, regions of the spectrum, interaction of electromagnetic radiation with molecules, Born-Oppenheimer approximation.
Microwave Spectroscopy – Rotation spectra-Instrumentation- Moment of inertia, Rotational Quantum numbers, Rotational Constant, Intensities of rotational spectral lines, Rotational – Vibrational Spectrum of diatomic molecules – Selection rules for rotational spectra.
Infrared Spectroscopy –Theory of infrared spectra-Degree of freedom in poly atomic molecules, Selection rule, Molecular vibration – Stretching and Bending modes, Calculation of stretching frequencies – fundamental Bands and Overtones, hot bands and Fermi resonance. Factors influencing vibrational frequency – Electronic effects, hydrogen bonding, solvent effect . Applications of IR Spectroscopy .
Raman Spectroscopy –block diagram, quantum theory of Raman scattering- Stokes and antistokes lines-selection rule, rule of mutual exclusion

UNIT 2 SPECTROSCOPY II (18 Hrs)

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UV Spectroscopy – Franck condon principle-intensity of spectral lines -Absorption laws, Selection Rules – Types, Electronic transitions – Position and Intensity of absorption, Molar extinction coefficient, Chromophore – Auxochrome Concept, Absorption and Intensity Shifts, Types of Absorption Bands, Interpretations of spectra of simple conjugated dienes and enons, Woodward-Fieser Rule, Application to dienes and enons.

NMR Spectroscopy –- Introduction, Theory of NMR, Phenomena of resonance, Modes of nuclear spin-Relaxation Process, Chemical Shift – Internal standard, δand τ scale, Shielding Effects, Factors affecting Chemical Shift, Spin-Spin interaction, Interpretations of spectra of ethylbromide, ethanol, acetaldehyde, acetone, toluene and acetophenone.
Mass Spectrometry – Basic principles,, Fragmentation pathway, Molecular ion peak, base peak, Meta stable ion, General rules for predicting the prominent peaks, Mc Lafferty Rearrangement, mass spectra of simple alkanes, cyclo alkanes, saturated alcohols and aliphatic ketones.

UNIT 4 Molecular Symmetry and Group Theory (6 hrs)
Symmetry of molecules-symmetry elements and symmetry operations – centre of symmetry, plane of symmetry, Identity – proper axis of rotation, improper axis of rotation – Schonflies notation – Point groups of simple molecules – Cnv, Cnh,H_2O,NH_3,N_2O_4,N_2F_2.

UNIT 5 Concepts and Applications of Nano Science (7 hours)
Introduction - Nanomaterials – Classification based on dimensions, Synthesis – Top down and Bottom up-chemical precipitation, mechano-chemical method, micro emulsion method, reduction technique, chemical vapour deposition and solgel method, Hydrothermal synthesis(brief study)- Important methods for the characterization of nanomaterials – Scanning electron microscopy (SEM), transmission electron microscopy (TEM). Synthesis and applications of Quantum dots, Carbon nanotubes and Graphene (brief study).

UNIT 6 Introduction to Computational chemistry (5 hrs)
Molecular mechanics and force fields, Electron structure theory methods, Ab-initio methods and Basis Sets, Hartree-Fock Theory, Semiempirical Methods, Electron Correlations, Density Functional Theory, Gaussian input file format, Z-matrix

References

1. Physical Chemistry – A molecular Approach: Mc Quarrie, J. D. Simon, Viva Books Pvt Ltd.
2. Fundamentals of molecular spectroscopy: C. N. Baanwell and E M Mc Cash, TataMc GrawHill
3. A Textbook of Physical chemistry: K. L. Kapoor, Volume 4, Macmillan India Ltd.
4. Physical Chemistry, I. N. Levine, Tata Mc Graw Hill.
5. Elements of Physical chemistry: Puri, Sharma and Pathania, Vishal Publishing Co.
6. Physical Chemistry, K. J. Laidler, John H.Meiser.
7. Physical Chemistry : P.W. Atkins, Oxford University Press.
8. Electronic absorption spectroscopy and related techniques: D. N. Satyanarayana, Universities Press.
9. Nanosciece and nanotechnology: V. S. Muraleedharan and A. Subramania, Ane Books Pvt. Ltd.
10. Nano; The Essentials: T. Pradeep, Mc Graw-Hill education.
11 Symmetry and spectroscopy of molecules: K.Veera Reddy, New Age.International(P) Ltd

12. A. Szabo and N. S. Ostlund, Modern Quantum Chemistry, Introduction to Advanced Electronic Structure Theory, 1st ed., revised (Dover, 1989). More mathematical detail for many of the ab initio electronic structure methods.
13. D. A. McQuarrie, Quantum Chemistry (University Science Books, Mill Valley, CA, 1983). Very readable introductory text for undergraduate-level quantum chemistry.
14. I. N. Levine, Quantum Chemistry, 4th ed. (Prentice Hall, Englewood Cliffs, NJ, 1991). Covers some of the topics in this course.

15.Errol Lewards-computational chemistry-Introduction to theory and applications of molecular and quantum mechanics.

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks	Unit	Marks
I	20	V	6
II	20		
III	7		
IV	9		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

Question papers in Physical Chemistry course should contain numerical problems for 20% of the total marks.

CORE COURSEXVII:ENVIRONMENTAL CHEMISTRY

(DISCIPLINE SPECIFIC ELECTIVE COURSE)

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B17CHE/PCH- A	3	3	3

Course Outcome

On successful completion of this course, students should be able to

CO1 Know the importance of environmental studies and methods of conservation of natural resources.

CO2 Describe the structure and function of an ecosystem and explain the values and Conservation of bio-diversity.

CO3 Explain the sources, environmental effects and control measures of various types of pollutions.

CO 4: Identify the toxic chemicals in environment and understand the sources, effects and treatmentof heavy metal poisoning

CO5: Understand the methods of domestic water treatment , Sewage analysis and Sewage treatment

Contact hours 54

Unit I . Environmental segments (6 hours)

Environmental segments: Lithosphere, Hydroshere, Atmosphere and Biosphere.

Atmospheric structure and composition - chemical composition of water in water bodies – (Ground water, river water and lake water, sea water wetlands)- Hydrological cycle.

Chemical Toxicology – Toxic chemicals in environment – Sources, effects and treatment

of heavy metal poisoning – Pb, As, Cd, Hg, Cr, Cu & Co. Minamata and Itai-Itai

diseases.

Unit II. Air Pollution (14 hours)

Pollutant-classification

Air pollution – Air pollutants –CO, NOx, SO2, H2S, Hydrocarbons, particulate matter.

Acid rain and its effects.

Green house effect and global warming – climate change – ozone chemistry and ozone hole- chlorofluorocarbons, dioxins. Photochemical smog (reactions) – El Nino phenomenon.Bhopal gas tragedy.Control of air pollution – control by devices – Stacks, filters, electrostatic precipitators, cyclone separators, scrubbers and catalytic converters.

Unit III. Water pollution (12 hours)

Water resourses, - water pollution – sources – Industrial effluents – agriculture discharge- oil spills – heavy metals – pesticides – detergents

Eutrophication – biomagnifications and bioaccumulation – experimental determination of Dissolved oxygen, BOD and COD – Thermal Pollution – Control of water pollution –ISI/BSI standards of drinking water. Hardness of water – causes and effects – methods of estimation – removal of hardness. Domestic water treatment – Sewage – Sewage analysis -Sewage treatment

Unit IV. Soil Pollution (11 hours)

Lithosphere – soil formation-Different types of weathering – components of soils – Acid Baseand ion exchange reactions in soil – soil pollution – soil acidification – effects onplants – liming of soil – Industrial and urban wastes – plastics, pesticides and heavymetals in soil – garbage –biomedical waste – E waste –Municipal Solid waste management. Bioremediation

Unit V. Noise and Radiation pollution (11 hours)

Noise pollution and Radioactive Pollution : Human acoustics - Noise – general features - types of Noise – Measurement of noise – sound pressure and power levels – sources and effects of noise pollution – prevention of hearing loss in industry – control of noise pollution.

Radiation chemistry – Man made and natural radiations – biological effects of radiation - radiation hazards from reactors –Fukushima nuclear disaster- radioactive wastemanagement

References:-

1. Environmental Chemistry, A.K.De.
2. Environmental Chemistry, P.S. Sindhu
3. Environmental Chemistry, B. K. Sharma
4. Essentials of environmental studies, S.P. Misra & S.N.Pandey
5. Advanced Inorganic Chemistry Vil. II , Gurdeep Raj
6. Engineering Chemistry , Dr. B.K. Sharma
7. Engineering Chemistry, Jain & Jain, Dhanpat Rai Publishing Company

8. A Basic course in environmental studies, Surinder Deswal & Anupama Deswal.

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks	Unit	Marks
I	6	V	12
II	16		
III	14		
IV	14		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE XVII:APPLIED CHEMISTRY

(DISCIPLINE SPECIFIC ELECTIVE COURSE)

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B17CHE/PCH- B	3	3	3

Course Outcomes :

On successful completion of this course, students should be able to

CO-1Explain the origin of coal,coal products ,petroleum products and their applications.

CO-2 Explain the manufacture of fertilizers , pesticides and their applications

CO-3 Understand the manufacture of glasses, cement ,ceramics and the formulations of paints and varnishes

CO-4 Familiarize with the chemistry of fats and oils and explain the production of soaps and detergents.

CO-5 Understand the chemistry of food additives and explain the manufacture and refining of pulp.

CO-6 Understand importance of industrial safety and industrial pollution control.

Hours:54

UNIT 1: Fuel chemistry (10 hrs)

Coal: Origin of coal, carbonization of coal, coal gas, producer gas, water gas, coal based chemicals.

Petroleum and Petrochemical Industry**:** Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels.

Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives.

UNIT 2: Agrochemistry (9 hrs)

Fertilizers: Classification of fertilizers, Manufacture of ammonium salts like ammonium nitrate, ammonium sulphate and urea. Action of Ammonium sulphate and urea as fertilizers.N.P.K.Fertilizers and Natural organic fertilizers.

Pesticides:Production and applications and residual toxicity of organochlorine pesticides (DDT, Aldrin), organophosphates (parathion, malathion), Carbamate (carbofuran). Bio-pesticides

UNIT 3: Silicate Industry (8hrs)

Glasses: Classification and manufacture of glasses, Annealing of glass. Fiber glass, coloured glass, and optical glass

Cement: Portland cement - types, manufacture, composition and setting of cement.

White cement and water proof cement.

Ceramic: Subdivisions- raw materials - manufacturing-applications.

UNIT 4: Paints, Lubricants, Adhesives and Pigments (10 hrs)Paints: Classification**,** primary constituents and manufacturing of a paint. Emulsion paint - constituents and advantages.Latex paints and fire retardant paints. Solvents and thinners.

Lubricants: Properties and classification, additives for lubricating oil, lubricants of mineral origin, lubricating grease and solid lubricants.

Adhesives: The Process of bonding. Classification and preparation of adhesives, synthetic resin adhesives, and rubber based adhesives, uses of adhesives.

Pigments: Characteristics and uses of titanium dioxide, ultra marine blue and red lead

UNIT 5: Food Chemistry (8 hrs)

Food additives:Food flavour, food colour, food preservatives, artificial sweeteners, edible emulsifiers and edible foaming agents- uses and abuses of these substances in food and beverages

Fermentation Chemicals: Production, and purification of ethyl alcohol, citric acid, lactic acid, Vitamin B12, Penicillin.

UNIT 6: Chemical Explosives. Industrial safety and pollution prevention (9 hrs)

Chemical explosives: Characteristic of explosives, preparation and explosive properties of Trinitro toluene, Lead azide , Nitroglycerine, RDX.

Industrial safety: OSHA-Hazard analysis and risk assesment-types of hazards in industries_risk management plan.

Industrial pollution prevention: Definition of industrial waste-types of industrial waste-Industrial pollution prevention-Recycling-waste treatment.

REFERENCES

1. B. K. Sharma: *Engineering Chemistry*, Goel Publishing House, Meerut

2. *Industrial chemistry* by B.K Sharma.

3. Industrial chemistry B.N Chakrabarthy

4. Stocchi: *Industrial Chemistry*, Vol-I, , Ellis Horwood Ltd. UK

5. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics*, Wiley Publishers, New Delhi

6. J. A. Kent: Riegel's *Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.

7. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas Publications, New Delhi.

8. P. C. Jain, M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi

9. Carey, D.E. Casida*Industrial Microbiology.*

10. *Mechanism and theory in food chemistry,* Dominic W.S.Wong

11. *Food Science* , R. Sreelakshmi

12. Mohammad Farhat Ali, Bassam M. El Ali,, James G Speight, *Hand book of Industrial chemistry: Organic Chemicals,* Publisher: Mc-graw Hill Education

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks	Unit	Marks
I	12	V	8
II	12	VI	10
III	10		
IV	10		

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE XVII: POLYMER CHEMISTRY

(DISCIPLINE SPECIFIC ELECTIVE COURSE)

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B17CHE/PCH- C	3	3	3

Course Outcome

On successful completion of this course, students should be able to

CO 1) Classify polymers and explain the configuration of polymers and properties like glass transition temperature and melting point of polymers

CO2) Illustrate the preparation, properties and applications of polymers

CO3) Interpret the mechanism of polymerization

CO4) Acquaint various polymer processing technologies and explain thermal methods of analysis of polymers

CO5) Know the recent advances in polymer chemistry

Contact Hrs : 54

1. Introduction. (16 hours)

Definition of monomer, polymer and polymerization – Classification of polymers - natural, semisynthetic and synthetic - condensation & addition polymers - Linear, branched and crosslinked polymers - Homo polymers and copolymers – Graft and block copolymers, composites, blends, elastomers, fibres, plastics, thermoplastic and thermosetting polymers. Tacticity in polymers-Isotactic, syndiotactic and atactic polymers.Properties of polymers : Glass transition temperature (Tg) - Definition- Factors affecting Tg - relationships between Tg and molecular weight and melting point. Importance of Tg.

2. Plastics, rubbers and fibres. (14 hours)

Preparation, properties and applications of - Plastics: Polyethylene, Polyvinylchloride, polymethyl methacrylate, polyethylene terphthatalate, Teflon, Bakelite. Rubbers: natural and synthetic rubbers – polybutadiene, polyisobutylene, butyl rubber, nitrile rubber, BUNA-S, BUNA N, neoprene rubber. Synthetic fibres : Nylon 66, Nylon 6, Rayon.

3. Polymerisation Techniques (14 hours)

Types of polymerization- addition (initiation, propagation and termination), condensation, ionic (cationic & anionic), Ring opening polymerizations (epoxy resins) coordination polymerization –

Ziegler Natta catalyst - moulding of plastics into articles- compression moulding - injection moulding - blow moulding - extrusion moulding – Calendering – Spinning.

4. Advances in Polymers (10 hours)

Biopolymers - biodegradable polymers - Polymers in medical field - High temperature and fireresistant polymers - Conducting polymers PAC, PPP, PPY etc - Polymers used as adhesive and coatings, liquid crystalline polymers, Vulcanization of rubber. Environmental Hazards of plastics and recycling

References:

1. V.R. Gowariker, N.V. Viswanathan and Sreedhar, *Polymer Science*, Wiley Easern Ltd.
2. F.W. Billmeyar, *A text book of polymer science*, John Wiley & Sons, 1971.
3. Maurice Morten, *Rubber Technology*, Van Nostrand, Reinold, New York.
4. S. Paul, *Surface Coatings*.
5. B.K. Sharma, *Polymer Chemistry*, Goel Publishing House, Meerut.
6. M. Jenkins, *Biomedical Polymers*, University Birmingham, U.K.
7. M.G. Arora, M. Singh and M.S. Yadav, Polymer Chemistry, 2nd Revised edition, Anmol Publications Private Ltd.

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks
I	17
II	15
III	16
IV	14

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

CORE COURSE XVII: NANOCHEMISTRY
(DISCIPLINE SPECIFIC ELECTIVE COURSE)

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B17CHE/PCH - D	3	3	3

Course Outcomes

On successful completion of this course, students should be able to

CO 1: Understand the basic concepts and classification of nanomaterials.

CO 2: Analyze different nano systems and their properties.

CO 3 :Understand the various techniques adopted for the synthesis and characterization of nanomaterials.

CO4 : Characterize the nanomaterials using various microscopic techniques.

CO 5: Understand the application of nanomaterials in various fields including catalysis, photonics, and medicine

Contact hours: 54 Hrs

Unit I Introduction to Nanomaterials (10 hrs)

Nanotechnology- Definition, Historical milestone. Faynmans hypothesis, Surface area to volume ratio, Quantum confinement, Classification of Nanomaterials based on dimesnsions (0D, 1D, 2D, 3D). Different types of nano systems (synthesis and properties)- Carbon nano systems- fullerenes, graphenes, carbon nanotubes; Inorganic nano particles-TiO_2, ZnO; Organic nano systems-dendrimers, Metal nano particles-quantum dots.

UnitII Nanosynthesis (16 hrs)

Various methods for the synthesis of nanoparticles: Top-down and Bottom-up approaches. Physical methods-Ball Milling, Melt mixing techniques, Physical vapour deposition, Chemical vapour deposition (CVD).Chemical methods-Chemical precipitation, Sol gel Method, Hydrothermal and Solvothermal synthesis, Microemulsion or Reverse micelle synthesis. Microwave synthesis, Electrochemical method. Biological synthesis using plant extract and micro organism.Molecular self assembly.

UnitIII.Nanomaterial Characterisation (16 hrs)

Important methods for the characterization of nanomaterials –Principles and Applications only- Scanning electron microscopy (SEM), Transmission electron microscopy (TEM), Scanning tunneling electron microscopy (STEM), Scanning probe microscopies (SPM)-Scanning tunneling microscopy (STM), Atomic force microscopy (AFM), Photoelectron spectroscopy (UPES and XPES), X-ray diffractometer (XRD). UV-visible and Raman Spectroscopy.

UnitIV Applications of Nanomaterials (12 hrs)

Nanomaterials for environmental Remediation- Photocatalysis, Water purification using nanomaterials, desalination of water, Heavy metal and oil spill removal. Solar energy conversion (Dye sensitized solar cells) and storage (Supercapacitors).Nanocatalyst.Biological applications- Imaging, labeling, targeted drug delivery.Nanomaterials in electronics and spintronics, Nanosensors.Applications in Self cleaning surfaces, sports equipments, and cosmetics.

References:

1. T. Pradeep, Nano: The Essentials, Mc Graw Hill Publishing Company, New Delhi (2007).
2. C. N. R. Rao and A.Govindraj, Nanotubes and Nanowires, Royal Society of Chemistry(2005).
3. V. S. Muraleedharan and A. Subramania, Nanosciece and nanotechnology, Ane Books Pvt. Ltd. New Delhi, 2009.
4. Dr.Ashuthosh Sharma,Dr.Bellari, Advances in Nanoscience and Nanotechnology- -CSIR Publication 2004
5. G. A. Ozin et.al, Nanochemistry: A Chemical Approach to Nanomaterials – Royal Society of Chemistry, Cambridge, UK 2005.
6. R. Booker and , E. Boysen, Nanotechnology, Wiley India Pvt Ltd, 2008.
7. K. J. Klabunde, Nanoscale materials in chemistry, John Wiley and Sons.
8. S.M. Lindsay, Introduction to Nanoscience, Oxford University Press.
9. K.K. Chattopadhyay and A. N. banergee, Introduction to nanoscience and Technology, PHI learning pvt. Ltd. Delhi.
10. Sulabha K. Kulkarni, Nanotechnology Principles and Practices, Capital Publishing Company,Kolkatta.
11. http://www.zyvex.com/nanotech/feynman.html
12. https://www.azonano.com/

Distribution of Marks for External Examinations

Marks including choice:

Unit	Marks
I	12
II	18
III	17
IV	15

Table 8. Type of questions & Marks for External Examination - Core Chemistry

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	4	4	1	4
Short answer	10	7	2	14
Short essay/Problems	6	4	3	12
Essay	4	2	5	10
	24	17		40

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SYLLABUS OF BSc CHEMISTRY PRACTICAL
SEMESTER I& II

CORE COURSE PRACTICAL I (1B02CHE/PCH& 2B02CHE/PCH)
Volumetric Analysis

72 hrs/ credit 3

Course Outcome

On successful completion of this course, students should be able to

CO 1) Apply the theoretical concepts while performing experiments.

CO2) Acquire practical skill to estimate acid, base, oxidizing agents etc by volumetric titration method

CO3) Estimate the metallic ions by complexometric titration method

CO4) Acknowledge experimental errors and their possible sources.

CO5) Able to prepare inorganic complexes

CO 6) Design, carry out, record and analyze the results of chemical experiments

Introduction to Volumetric analysis

Equivalent and molecular mass of compounds. Normality and Molarity -Primary

standards. Preparation of standard solution - Principles of volumetric analysis. For acidimetry, alkalimetry and permanganometry two burette method may be used and for other volumetric analyses conventional methods can be used.

1 Acidimetry And Alkalimetry

a)Estimation of NaOH/KOH using standard Na_2CO_3.

b) Estimation of $HCl/H_2SO_4/HNO_3$ using standard oxalic acid.

2 Permanganometry

a. Estimation of oxalic acid.

b. Estimation of Fe^{2+}

c. Estimation of Nitrite.

3 Dichrometry

a. Estimation of Fe^{2+} -using internal and external indicator

b. Estimation of Fe^{3+} - reduction by SnCl2 - internal indicator

4 Iodometry And Iodimetry

a. Estimation of Cu^{2+} / CuSO4 SH2O.

b. Estimation of potassium dichromate.

c. Estimation of As2O3/As^{3+}

5 Precipitation titration-using adsorption indicators

Estimation of chloride in neutral medium

6 Complexometry

Estimation of Mg^{2+}, $Zn^{2+}$and hardness of water

Inorganic Preparation

a .Ferrous ammonium sulphate.

b. Potash alum.

c Tetraammine copper(II) sulphate.

d Potassium trisoxalato chromate.

Prepare any one sample in the examination and exhibit the product.

SEMESTER III& IV

(3B05CHE/PCH& 4B05CHE/PCH) Inorganic Qualitative Analysis

Credit 3

72hrs

Course Outcome

On successful completion of this course, students should be able to

CO 1) Apply the theoretical concepts while performing experiments.

CO2) Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts

CO 3) Able to design, carry out, record and analyze the results of chemical experiments

CO 4) Learns the effective usage of chemicals

1 Systematic qualitiative analysis of mixtures containing two anions by semi micro method. Study of the reactions of the following anions with a view to their identification, confirmation and procedure for elimination - carbonate, acetate, oxalate, fluoride, bromide, iodide, nitrate, sulphate, borate, phosphate, chromate, arsenate, arsenite. One of the anion should be eliminating radical.

2 Systematic qualitative analysis of mixture containing two cations by semimicro method. The cation mixtures may given as solution.

Study of the reaction of the following ions with a view to their identification and confirmation.

Lead, bismuth, copper, tin, iron, aluminum, zinc, manganese, cobalt, nickel, barium, strontium, calcium, magnesium, NH_{4+}

Note : minimum ten mixtures should be analyzed and recorded.

SEMESTER V& VI

5B11 CHE /PCH & 6B11 CHE/PCH : GRAVIMETRIC ANALYSIS

Credit:3

Course Outcome

On successful completion of this course, students should be able to

CO1: Make use of standardised procedures for the Gravimetric analysis

CO2: learn the skills of Precipitation process, digestion, filtration, incineration etc.

CO3:Aquire practical Knowledge of co-precipitation

CO4: Handle sintered glass vessels

CO5) Acknowledge experimental errors and their possible sources.

CO6Able to design, carry out, record and analyze the results of chemical experiments

Introduction to gravimetric techniques and its highlights.

1. Determination of water of hydration in crystalline barium Chloride.
2. Determination of barium as barium sulphate.
3. Determination of sulphate as barium sulphate.
4. Determination of iron as ferric oxide.
5. Determination of calcium as calcium carbonate.
6. Estimation of nickel as nickel dimethylglyoxime.
7. Determination of copper as cuprous thiocyanate.
8. Determination of magnesium as magnesium oxinate.

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SEMESTER V& VI

5B12 CHE/PCH& 6B12 CHE/PCH : ORGANIC CHEMISTRY

Credit:3

Course Outcome

On successful completion of this course, students should be able to

CO 1) Apply the theoretical concepts while performing experiments.

CO2) Acquire practical skill in qualitative analysis of organic compounds

CO 3) Acquire practical skill in preparing organic compounds and in their purification by crystallisation

CO4) Separate organic compounds in a mixture –by steam distillation, TLC and Column Chromatography

CO5) Acquire the habit of working safely with the chemicals and handling of equipments

1. Synthesis of Organic Compounds.

a. Aromatic electrophilic substitution:

Nitration

Preparation of dinitrobenzene from nitrobenzene. Preparation of p-nitroacetanilide

Halogenation -

Preparation of *p*-bromoacetanilide.

preparation of 2, 4, 6 - tribromophenol.

b. Diazotization and coupling :

Preparation of phenyl azo β-naphthol.Preparation of methyl orange.

c.Oxidation :

Preparation of benzoic acid from benzyl chloride or benzaldehyde

d.Esterification :

Benzoylation of phenol/aniline to phenyl benzoate.

e. Hydrolysis : Benzamide or ethylbenzoate to benzoic acid.

2.Organic Qualitative Analysis

a. Qualitative analyses with a view to characterize functional group/groups in the following compounds:

Naphthalene, anthracene, chlorobenzene, bromobenzene, benzyl chloride, *p*-dichlorobenzene, benzyl alcohol, phenol, cresols, naphthols, resorcinol, benzaldehyde, acetophenone, benzophenone, benzoic acid, phthalic acid, cinnamic acid, succinic acid, salicylic acid, ethyl benzoate, methyl salicylate, benzamide, urea, aniline, toludines, dimethyl aniline, nitrobenzene, *o*-nitrotoluene, glucose, sucrose.

b. Preparation of derivatives.

Note : Minimum ten compounds should be analyzed and recorded. For analysis, reactions may be carried out in tiles, wherever possible.

3. Thin layer Chromatography and Column Chromatography

a. Preparation of the TLC plates - Checking the purity of the compounds by TLC - Acetylation of salicylic acid, aniline, Benzoylation of aniline and phenol, Determination of Rf. Values and identification of organic compounds by TLC, preparation and separation of 2, 4 -dinitrophenyl hydrazones of acetone and 2- butanone using toluene and light petroleum (40 :60).

b. Separation of ortho and para nitroaniline mixture by column chromatography.

4. Demonstration Experiments Steam distillation : Separation of ortho and para nitro phenols.

SEMESTER VI

6B18CHE/PCH `PHYSICAL CHEMISTRY

CREDIT: 3

Hrs/week: 3

Course Outcome

On successful completion of this course, students should be able to

CO 1)Acquire practical skill in physical chemistry experiments such as Cryoscopy, Transition Experiments ,Phase Rule Experiments, Conductometric titrations ,Potentiometric titrations , colorimetry and Chemical Kinetics

CO2) Learn statistical approach for evaluating data

CO3) Able to carry out and record these experiments in a skilful manner

CO4) Acquire the habit of working safely with the chemicals and handling of equipments

1: Cryoscopy Using Solid Solvent

a) Cryoscopic constant of solid solvent using a solute of known molar mass (cooling curve method)

Solid solvents/solutes given: Naphthalene, Biphenyl, diphenyl amine.

b)Molar mass of the given solute, using solvent of known K_f.

Solid solvents/solutes given: Naphthalene, Biphenyl, diphenyl amine.

2: Transition Experiments (cooling curve method)

a) Transition point, depression constant (KT) of the given Salt hydrate, using solute of known molar mass.

salthydrates: $Na_2S_2O_3.5H_2O$./ $CH_3COONa.3H_2O$. Solutes : Urea, Glucose,

b) Molar mass determination of given solute using salt hydrates of known

(KT) Salt hydrates and solutes as above

3: Phase Rule Experiments

Critical Solution Temperature (C.S.T)

a) Critical solution temperature of phenol - water system

b) Concentration (% composition) of NaCl/KCl by C.S.T Measurements

4. Conductometry

Conductometric titrations

a) Strong acid x strong base

b) Weak acid x strong base

5 : Potentiometry

Potentiometric titrations

a) Acid base titration (Strong acid, strong base)

6 : Distribution Law

Partition coefficient of I_2 between CCl_4 and H_2O

7. colorimetry

Verification of Beer-Lambert law for KMnO4, determination of the concentration of the given solution.

8. Chemical Kinetics - Hydrolysis of methyl acetate using HCl acid.

9. Surface tension –Measurment using Stalagmo meter

Note:

1. A minimum number of 8experiment should be done
2. Electronic balance may be used for practical work.

VIVA VOCE

Viva voce examination based on practical will be conducted along with every practical examination.

REFERENCES

1. A.I.Vogel - A Text Book of Qualitative Analysis including semi-micro methods
2. V.V.Ramanujan - Semi micro Qualitative Analysis.
3. A.I.Vogel - A Text Book of Quantitative Inorganic Analysis.
4. A.I.Vogel - Elementary Practical Organic Chemistry.
5. A.O.Thomas - Practical Chemistry for B.Sc Chemistry.
6. A Findlay - Practical Physical Chemistry.
7. R.C.Das & E Behara - Experimental Physical Chemistry.
8. N.K.Vishnoi - Advanced Practical Chemistry.
9. Y.B. Yadav, Practical Physical Chemistry.

STUDY TOUR

Students are required to visit at least one Laboratory/factory/Research Institute ofeminence during the course and submit the Study tour report separately along with practical records at the time of practical Exam (6th Semester).

PROJECT REPORT:

PROJECT CO 1) Able to enhance the skills of managing the resources, time and team work.

2) Students will be able to function as a member of an interdisciplinary problem solving team.

Students should undertake a group project work related to chemistry and submit the report along with practical records during VI semester practical.

General Guidelines of Project Work

1. Students should undertake the project work related to Chemistry only.
2. The UG level project work is a group activity, maximum number of students being limited to five. However each student should prepare and submit the project report separate
3 The matter should be typed on A-4 size paper with Times New Roman font of size 12 points, with double spacing between the lines and margins of 1.5’ at the left, 1’ at the right, 1’ each at the top and bottom.
4 The report should be printed in plain white paper in black ink only. Color inks for charts and graphs can be used, provided it does not hamper the readability. The logo of the college can be displayed in the report.
5 The project report should be hard bound/ spiral bound / paper back.

Format of the Project Report

Title

Emblem

Name of the student

Department

College

Month & Year

Title

Emblem

Project report submitted to Kannur University in partial fulfillment for the BSc degree (Chemistry)

By

Name of Student

Reg No

Name & Designation of project guide

Signature, Name & Designation of Head of the department

Examiners:

1)

2)

Page I : Certificate (By Project Guide)
Page 2. Declaration (By Student)
Page 3. Acknowledgement
Page 4 . Contents

Chapter I : Introduction

Chapter II : Aim of the project/Problem Statement

Chapter III : Review

Chapter IV : The Study/Present work

Chapter V : Data Analysis/ Discussion

Chapter VI :Conclusion

Bibliography

MODEL QUESTION PAPERS FOR PRACTICALS

B.Sc CHEMISTRY PRACTICAL EXAMINATION
SEMESTER 11-

1B02CHE/PCH& 2B02CHE/PCHVolumetric Analysis

Time : 3 Hours Maximum marks:40

Credit : 3

Instruction : candidate should submit bonafide record at the time of examination

1. Write down the Principle for the estimation of …………………………………..given …………………………………..
2. Calculate the weight of ……………………….. required for the preparation of ………………N,……………ml solution.
3. Estimate the amount of ……………. in the whole of the given solution provided with ……………solution and ………………crystals.
4. Exhibit the samples of inorganic complexes prepared
5. Viva Voce

SEMESTER IV

PRACTICAL II :

3B05CHE/PCH& 4B05CHE /PCH INORGANIC QUALITATIVE ANALYSIS

Time: 4Hours Maximum Marks:40

Credit: 3

Instruction : candidate should submit bonafide record at the time of examination

1. Analyse systematically the given mixture containing the anions and cations by semi-micro method.
2. Viva Voce.

SEMESTER VI 5B11CHE/PCH& 6B11CHE/PCH

PRACTICAL III : *GRAVIMETRIC ANALYSIS

Time : 3 Hours Maximum Marks:40

Credit: 3

1 Write a brief outline of the procedure for the gravimetric estimation of ………………… …………………..in the solution………………

2 Estimate gravimetrically the amount of ………………..in the whole of the given……………………. Solution.

3 Viva Voce

SEMESTER VI 5B12CHE/PCH& 6B12CHE /PCH

PRACTICAL IV:*ORGANICCHEMISTRY

Time : 3 Hours Maximum Marks:40

Credit: 3

1. Write down the procedure for the preparation of………………..from…………..
2. Analyse systematically the given organic compound with a view to identify the functional group present in it and submit a report of the procedure adopted. Suggest a suitable solid derivative for the compound and write the procedure for its preparation..

3. Convert the given ……………….into……………………………….Recrystalise and

exhibit both crude and recrystalised samples.

4. Viva Voce.

*Practical paper III & paper IV are to be conducted in the sixth semester for 6hrs on the second day.

SEMESTER VI

PRACTICAL V: 6B18CHE/PCH PHYSICAL CHEMISTRY

Time : 4 Hours

Credit : 3

Instruction : Candidate should submit bonafide record at the time of examinat ion.

Attempt the question marked X

1. Determine the moleculr mass of the given solute B by cryoscopic method. K_f of solid solvent A is ---------. Conduct a duplicate experiment.

2. Determine the rate constant for the hydrolysis of the given ester in the presence of the given acid. Calculate 5 k values. Obtain k value graphically.

3. Determine the Cryoscopic constant of the given solid solvent A using solute B of molecular mass---------. Conduct a duplicate experiment.

4. Determine the mass of HCl in the given solution conductometrically.

5. Write down the procedure for the experiment marked X within first 5 minutes. 6. Submit the Project Report & Report of Industrial visit.

7. VIVA VOCE

GENERIC ELECTIVE COURSE

CHEMISTRY IN SERVICE TO MAN

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D01CHE/PCH	2	2	2

Contact hours:36Hrs

Course Outcome

On successful completion of this course, students should be able to

CO1) i) Understandthe classification, structure, function and applications of polymers

ii) Understand the importance of biodegradable polymers

CO2) Acquaint with different types of fertilizers and pesticides and understand the effect of fertilizers and pesticides on the environment

CO 3) Explain the classification of fuels and composition of petroleum and familiarise the fuel cells and batteries and Understand their applications in modern life

CO 4) Explain different types of glasses ,their applications and the composition of Portland cement

CO5) Identify the harmful chemicals present in cosmetics and understand their effects in human body

Unit 1. PLASTICS &POLYMERS(10hrs)

Polymers- Types of polymers natural & synthetic polymers-characteristics and examples.

General characteristics and applications of polymers such as Polythene (LDPE &HDPE), polypropylene, PVC, Poly styrene. Artificial fibers -examples

Plastics- Thermoplastics and thermosetting plastics- Characteristics and examples..

Elastomers Natural and synthetic rubbers-Vulcanization(mention only. Biodegradable polymers .examples.

benefits of biodegradable plastics. Importance of plastic recycling.

Unit 2. FERTILIZERS &INSECTICIDES(7hrs)

Natural , synthetic mixed and NPK fertilizers – examples. -Impact of excessive use of fertilizers on environment – Bio fertilizers –Pesticides and their classification- examples. Excessive use of pesticides.

Environmental hazards.Safe handling of pesticides. Insect repellants

Unit 3. FUELS, CELLS &BATTERIES(7hrs)

Definition and classification of fuels – Characteristics of good fuel – Combustion - Calorific value – wood- coal - petroleum-origin –differentfractions, their composition & uses. Natural gas, Biogas & LPG – their composition and uses.

Pollution due to burning of fossil fuel -Batteries and fuel cells – Different types – Applications in modern life.

Unit 4 CEMENT&GLASS(6hrs)

Cement- Classification – Portland cement – Raw materials – manufacture – setting and hardening – Glass – Different types – manufacture – raw materials – manufacture ofordinary glass

5. COSMETICS(6hrs)

Cosmetics – Cleansing cream,cold cream, bleaching &vanishing creams, perfumes, talcum powder, tooth paste, deodorants , lipstick –ingredients. Harmful chemicals in cosmetics

References:-

1. J Barrett: Chemistry in your environment-User friendly, Simplified Science.

2. Howard L White: Introduction to Industrial Chemistry

3. David M Targarden: Polymer Chemistry – Introduction to an indispensible science.

4. M.S.Yadav: Synthetic drugs

5. Samuel Delvin: Dyes and Pigments

6. Alexander Findlay: Chemistry in the service of man

7. S. K Honda: Principle of pesticide chemistry

8. M.M.Chakrabarthy: Chemistry and Technology of oils and fats

9. ShaliniSareen: Chemotherapeutic agents

10. P.K.Ray: Pollution and health

11. Vanessa Good ship: Introduction to plastic recycling

12.RandySchmetter and Perry Romanoswski: Beginning cosmetic chemistry.

13. V Jain: Organic polymer chemistry

14.V K Selva raj: Advanced polymer chemistry

15. Jr Charles E Carraher: Introduction to polymer chemistry

16. Shashi Chawla: A Text Book of Engineering Chemistry

17. Jain &Jain : Engineering Chemistry

Distribution of Marks for Generic Elective Course
<u>Marks including choice</u>:

Unit	Marks	Unit	Marks
I	9	V	5
II	6		
III	5		
IV	5		

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

GENERIC ELECTIVE COURSE

DRUGS - USE & ABUSE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D02CHE/PCH	2	2	2

Contact hours:36Hrs

Credit 2

<u>Course Outcome</u>

On successful completion of this course, students should be able to

CO 1) Familiarise the classes of drugs and their examples

CO 2) Distinguish prescription drugs and over the counter drugs

CO 3) Understand the roots of administration of drugs and their importance

CO 4) Familiarise various synthetic drugs and their uses

CO 5) Understand the consequences of misuse of antibiotic

CO 6) Recognisethe drugs of abuse and understand the consequences of drug abuse

INTRODUCTION(5HRS)

Drugs- Definitions, Classifications – Prescription drugs and Over the Counter drugs- examples of drugs- Roots of drug administrations,Enteral, parentaral and topical routes. Bioavailibility of drugs -Advantage and disadvantage of various routes of administrations-

PHARMACOKINETICS (10HRS)

Definition ofPharmacokeinetics- A brief explanation of Absorption, Distribution-Metabolism (Biotransformation) and Excretion . First pass metabolism,Therapeutic index , Drug tolerance, Placebo , Adverse drug reactions .

SYNTHETIC DRUGS (8HRS)

Examples of Antipyretics , analgesics and anti inflammatory agents . A brief explanation of their mode of action .Anti biotics- Discovery and its importance. Examples of antibiotics - Antibiotic misuse .Anti histamines- examples , Antacids , anti- ulcer drugs . Drugs acting on Central Nervous System, Cardiovascular drugs classification and examples.

MISCELLANEOUS DRUGS (6 HRS)

Antiseptics and disinfectants, Vaccines, Vitamins and Minerals, Enzymes and Hormones, Treatment in poisoning.

DRUGS OF ABUSE:- (7HRS)

Classification of drugs of abuse -Narcotic analgesic CNS Stimulants examples and effects, Depressants, Hallucinogens examples and effects, Sadatives, hypnotics example and effects ,Opioids, Cannabis and Inhalants examples and effects . Drug dependence, withdrawal symptoms , tolerance and addiction.

References

1. Drugs - G.L. David Kurupadanam,Vijayaprasad,KVaraphiipatrasad Rao et.al.

2. Medical Pharmacology- PadmajaUdayakumar

3. Essentials of Medicinal Pharmacology - Tripathi

4. Medicinal Chemistry - AshuthoshKar

5.Dispensing Pharmacy -Kapoor & Gunn

6. A Text Book of Forensic Pharmacy - B.M. Mithal.

7. A Text Book of Organic and Pharmaceutical Chemistry - Wilson &Gisvold

Distribution of Marks for Generic Elective Course
<u>Marks including choice</u>:

Unit	Marks	Unit	Marks
I	5	V	5
II	8		
III	8		
IV	4		

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

GENERIC ELECTIVE COURSE

Environmental Studies

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D03CHE/PCH	2	2	2

Contact hours:36Hrs

Course Outcome

On successful completion of this course, students should be able to

CO 1) Differentiate the environmental segments and understand the importance of environmental segments

CO 2) Identify the types of environmental pollution and the various sources of the pollution

CO 3) Understand the consequences of environmental pollutions

CO 4) Explain the measures of control of environmental pollution

CO 5) Recognise various sustainable energy sources

UNIT1. Environmental segments 6 Hours

Environmental segments – Lithosphere: soil formation – components of soils.Hydrosphere: Hydrological cycle- Biosphere - Atmosphere- Structure and composition

UNIT 2. Air Pollution 9 Hours

Types of pollutants

Air pollution –Sources – pollutants –CO, NOx, Sox, Hydrocarbons, Particulates. Effect on ecosystem., Ozone layer –importance, Ozone depletion-Control measures- Acid rain-controlof acid rain- Green house effect-global warming,-photochemical smog(Eqns not needed)- effect pollution on plants and human beings. Control of air pollution Noise Pollution – physiological response to noise – biological effects- carbon foot print

UNIT 3.Water Pollution 7 Hours

Water Pollution – Sources –Industrial effluents- agriculture discharge - oil spills-heavy metal -pesticides-biomagnifications and bioaccumulations

Dissolved oxygen in water, chemical oxygen demand (COD) and biochemicalOxygendemand(BOD)(Definition only)- control of water pollution- ISI/BIS standards of drinking water

UNIT 4. Soil Pollution8 Hours

Soil Pollution - Sources by industrial and urban wastes, radioactive pollutants, plastics

heavy metals.Poisoning by heavy metals – Mina- matha&itai-Itai diseases.

Control of soil pollution.- Solid waste Management -Thermal pollution

definition-sources of thermal pollution , harmful effect of thermal pollution

prevention of thermal pollution.

UNIT 5. Sustainable Energy Sources & Technology 6 Hours

Green energy Sources- Wind-water-solar– use of solar energy in space-

Production of electricity using solar energy- Tidal, Biomass and geothermal energy

References:

1.Text book of Environmental Studies for under graduate courses – ErachBhar

2. Essential Environmental studies- S. P. Misra – S. N. Pandey

3. Environmental chemistry and pollution control – S.S Dara (2nd Edition)

4. Environmental chemistry- Peter O' Neill

5. Environmental chemistry – B.K. Sharma

6. Fundamental concepts of environmental chemistry – G.S Sodhi

7. Environmental Chemistry. A.K De

Distribution of Marks for Generic Elective Course

Marks including choice:

Unit	Marks	Unit	Marks
I	4	V	4
II	10		
III	7		
IV	5		

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

GENERIC ELECTIVE COURSE

NANOMATERIALS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D04CHE/PCH	2	2	2

Contact hours:36 Hrs

Course Outcome

On successful completion of this course, students should be able to

CO 1) Understand the basic concepts of nanoscale science and technology.

CO2) Inculcate the enquiry based learning and increase the level of interest in nanoscience.

CO3) Understand the societal implications and the scope of nanotechnology.

1. Introduction to Nanomaterials (10hrs)

Nanotechnology-Definition,Size and Scale, Historical milestone. Medicinal use of gold in ancient India.Nano objects in nature (few examples). Classification of Nanomaterials based on dimesnsions (0D, 1D, 2D, 3D) Examples. Fullerenes, graphenes, carbon nanotubes properties and applications.Polymer nano compositesand their applications (brief study).

2. Nano particle synthesis (14hrs)

Biological synthesis using plant extract.Chemical/bottom up method: Chemical precipitation method, Sol gel method, Metal nano crystals by reduction, Microwave irradiation (brief study). Physical- method: Ball milling (Top down), Vapour deposition (brief study). Lab.demonstration of any of the synthesis method.Methods for characterization viz:XRD,SEM,TEM(mention only)

3. Scope/Applications of Nanotechnology (12 hrs)

Nano technology for sustainable development: Solar energy conversion (DSSC) and storage (Supercapacitors). Self cleaning surfaces.Water purification using nanomaterials (nanofilters), desalination of water, heavy metal and oil spill removal.Biological applications-Imaging, labeling, targeted drug delivery (preliminary ideas only). Applications in Nanoelectronics, Sports equipments, and cosmetics (brief study).

References:

1\.T. Pradeep, Nano: The Essentials, McGraw Hill Publishing Company, New Delhi (2007).

2. C. N. R. Rao and A.Govindraj, Nanotubes and Nanowires, Royal Society of Chemistry(2005).

3V. S. Muraleedharan and A. Subramania, Nanosciece and nanotechnology, Ane Books Pvt. Ltd. New Delhi, 2009.

4. Dr.AshuthoshSharma,Dr.Bellari, Advances in Nanoscience and Nanotechnology- -CSIR Publication 2004
5. G. A. Ozin et.al, Nanochemistry: A Chemical Approach to Nanomaterials – Royal Society of Chemistry, Cambridge, UK 2005.
6. R. Booker and , E. Boysen, Nanotechnology, Wiley India Pvt Ltd, 2008.
7. K. J. Klabunde, Nanoscale materials in chemistry, John Wiley and Sons.
8. S.M. Lindsay, Introduction to Nanoscience, Oxford University Press.
9. K.K. Chattopadhyay and A. N. banergee, Introduction to nanoscience and Technology, PHI learning pvt. Ltd. Delhi.
10. Sulabha K. Kulkarni, Nanotechnology Principles and Practices, Capital Publishing Company,Kolkatta.
11. http://www.zyvex.com/nanotech/feynman.html
12. https://www.azonano.com/

Distribution of Marks for Generic Elective Course

Marks including choice:

Unit	Marks
I	8
II	12
III	10

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

GENERIC ELECTIVE COURSE

CHEMISTRY IN EVERYDAY LIFE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D05CHE/PCH	2	2	2

Contact hours - 36 hours

Course Outcome

CO 1) Identify the harmful ingredients and their effects of cleansing agent and cosmetics

CO 2) Familiarise adulterants in food, food additives and food preservatives

CO 3) Explain the harmful effects of modern food habits

CO 4) Classify the drugs and familiarize the applications of various drugs

CO 5) Understand the consequences of misuse of antibiotics

CO 6) Prepare toilet soap using vegetable oil

Module 1

Cleansing Agents and Cosmetics (12 hrs)

Cleansing Agents: Soaps - Hard and soft soaps - Alkali content – TFM - Detergents (classification) – Cleaning action - Advantages and disadvantages of soaps and detergents

Shaving creams, Shampoos: Ingredients and functions - Different kinds of shampoos (Anti-dandruff, anti-lice, herbal and baby shampoos).

Tooth paste: Composition and health effects. Cosmetics: Hair dye: Chemicals used and its harmful effects.

Face and skin powders: Types, ingredients and functions. Cleansing creams: Cold creams, vanishing creams and bleach creams.

Perfumes, antiperspirants, Sun screen preparations, nail polishes, lipsticks, eyebrow pencils and eye liners (ingredients and functions) – Harmful effects of cosmetics.

Module II: Food (10 hrs)

Common Adulterants in Different Foods: Milk and milk products, vegetable oils, cereals, tea, coffee powder, chilly powder and beverages.

Food Additives and food preservatives – Commonly used permitted and non-permitted food colours

Artificial sweeteners – Taste enhancers - Artificial ripening of fruits and its side effects.

Modern Food Habits: Definition and health effects of fast foods, instant foods, dehydrated foods and junk foods. Harmful effects of modern food habits.

Module III Practical: (8 Hrs) Training on Soap Manufacturing

Module IV

MEDICINES (6hrs)

Drugs- classification-examples and uses . Antibiotics -Discovery, examples and importance. Misuse of antibiotics.Antipyretics ,analgesics and anti-inflammatory agents , narcotic analgesics Anesthetic,

Antiseptic, Anti histamines and tranquillizers, - examples, and and use. Disinfectant &germicides examples, .importance and uses.

References

1) B.K. Sharma, Industrial Chemistry, 11th Edition, Goel publishing House, Meerut, 2000.
2) Lillian Hoagland Meyer, Food Chemistry, 1st Edition, CBS Publishers & Distributors, New Delhi, 2004.
3) Brian A. Fox, Allan G. Cameron and Edward Arnold, Food Science, Nutrition and Health, 6th Edition, Edward Arnold, London, 1995.
4) . M.S.R. Winter, A Consumer's Dictionary of Cosmetic Ingredients, 7th Edition, Three Rivers Press, New York, 2009.
5) 6. Alexander Findlay: Chemistry in the service of man

Distribution of Marks for Generic Elective Course
Marks including choice:

Unit	Marks
I	8
II	8
III	10
IV	4

Table 10. Type of Questions & Marks for External Examination – Generic Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Marks for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	5	3	2	6
Short essay/Problems	5	3	3	9
Total	15	11		20

COMPLEMENTARY ELECTIVE COURSE

Chemistry for Physical & Biological Sciences

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1C01CHE/PCH	2	2	2

Contact Hrs –36

Course Outcome

On successful completion of this course, students should be able to

CO1) Understand the atomic structure, basics of quantum chemistry and its applications.

CO2) Explain theories of chemical bonding and molecular structure.

CO3) Classify environmental pollution and recognise the causes of pollution

CO4) Understand the basic concept of Chemical equilibrium and theories of acids and bases

CO 5) Calculate pH values

CO 6) Explain common ion effect and solubility product

UNIT I : Atomic Structure and Periodic Table (10 hrs)

Bohr atom Model (No derivation) – Atomic Spectra of Hydrogen – limitations – wave mechanical concept of atom – Heisenberg's Uncertainty Principle – Dual nature of electrons – De Broglie equation – quantum numbers. Orbit and orbitals – Wave function and significance of $\psi^{2.}$ Schrodinger equation (no derivation). The periodic table – periods and groups-s, p, d and f block elements – modern concept – periodic trends – atomic radii, ionic radii & covalent radii – effective nuclear charge and screening effect – Ionization potential – electro negativity and electron gain enthalpy.

UNIT II : Chemical bonding (10 hrs)

Types of chemical bonds-Ionic, covalent and co-ordinate bonds. Lattice energy of ionic compounds – Born Haber cycle. VSEPR theory and its applications. Shape of molecules CO_2, BeF_2, BF_3, CH_4, NH_3, H_2O, NH_4^+, PCl_5, SF_6, ClF_3. Orbital overlapping – Hybridization sp, sp^2, sp^3, sp^3d, sp^3d^2, d^2sp^3 and dsp^2 hybridization.
V.B Theory. MO theory.Formation of B_2, C_2, N_2 and O_2 molecules. Hydrogen bonding, types of hydrogen bonding – example

UNIT III : Environmental Chemistry (10 hrs.)

Introduction-environment and segments- Pollutants of water – sewage, industrial effluents, soap and detergents, pesticides, fertilizers, heavy metals, Biological magnification and bioaccumulation, Toxic effect of pollutants, Water quality parameters – DO, BOD and COD, Water purification- sedimentation, coagulation, filtration, disinfection, ion exchange, desalination, Air pollution – major regions of atmosphere, pollution by oxides of N, S, C, hydrocarbons and other organic chemicals, automobile exhausts, their physiological effects on vegetation and living organisms, Ozone layer – importance – depletion of ozone – consequences, Greenhouse effect – global warming – acid rain, Toxicity and environmental hazards of pesticides, Radiation pollution and noise pollution.

UNIT IV :Ionic Equilibrium (6 Hrs)

Concepts of Acids and Bases-Arrhenius, Lowry- Bronsted and Lewis concepts, ionization of weak electrolytes.pHand pOH values.Buffer solutions and calculations of their pH. Henderson equation(numerical problems expected). Solubility product and common Ion effect.Hydrolysis of salt – degree of hydrolysis and hydrolytic constant, derivation of relation between Kw and Kh for salts of strong acid – weak base, weak acid – strong base and weal acid – weak base.

Distribution of Marks for Complementary Elective Course

Marks including choice:

Unit	Marks
I	14
II	14
III	14
IV	10

Type of Questions & Marks for External Examination- Complementary Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

COMPLEMENTARY ELECTIVE COURSE

Chemistry for Physical & Biological Sciences

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2C02CHE/PCH	2	2	3

Contact Hrs – 36

Course Outcome

On successful completion of this course, students should be able to

CO 1) Understand the basic concept of classification, IUPAC nomenclature, bonding and structure of Organic compounds

CO2) Explain the concept of aromaticity and non-benzenoid aromatics

CO3) Understand the basic concepts of chemical equilibrium . Explain colloids, their properties and applications

CO4) Illustrate the laws of photochemistry and Explain the photochemical phenomena such as Photosensitization, quenching, Fluorescence, Phosphorescence, Chemi luminescence and bioluminescence.

CO5) Familiarise different types of analytical methods in chemistry and explain the principle of colorimetry

CO 6) Explain the principles underlying the qualitative and quantitative analysis

UNIT I : : Introduction to organic chemistry (8 Hrs)

Classification of organic compounds – functional groups,Homologous series –Hybridization and shapes of molecules like methane, ethane, ethylene and acetylene – IUPAC nomenclature of hydrocarbons, organic compounds bearing functional groups –Structure of Benzene –

Aromaticity-Huckel’s rule. Non Benzenoid Aromatic systems-cyclopropenyl cation, cyclopentadienyl anion, tropelium cation, Pyrrole, Pyridine

Bond fission – homolysis and heterolysis – carbonium ion – carbanion – and free radicals.

. UNIT II : Chemical equilibrium (6 hours)

Reversible reactions – Law of mass action – relationship between Kc, Kp and Kx- thermo dynamic derivation of chemical equilibrium. Liquid systems – Le-Chatlier’s Principle – Effects of temperature, pressure and concentrations.

UNIT III : Photochemistry (4 hrs)

Chemical reactions Vs Photochemical Reactions. Laws of photo chemistry – Grotthus – Draper Law and Stark-Einstein law of photo chemistry. Beer Lambert Law- Quantum yield – Photo sensitization and quenching- Fluorescence and Phosphorescence – Chemiluminescence and bioluminescence.

UNIT IV : Colloids (8 hrs)

Classification – preparation – structure and stability – The electrical double layer – zeta potential – Properties of Colloids – Tyndall effect – Brownian movement- Coagulation of colloidal solution – Hardy-Schultz rule – Flocculation value – protective colloids – Gold number – Emulsions – oil in water and water in oil type emulsions – Emulsifying agents – Gels – imbibition – syneresis – applications of colloids in food, medicine and industry.

UNIT V : Analytical Chemistry (10hrs)

Analytical chemistry – Types of analytical methods –Qualitative and Quantitative analysis, Electrochemical methods, Spectroscopic analysis, Thermal methods (introduction only) –

Accuracy and precision. Errors-classification

Inorganic Qualitative analysis - Solubility product – ionic product – common ion effect- principle of separation of cations in various groups.

Concept of molarity, Normality, Molality (numerical problems expected). Principle of volumetric analysis – Acidimetry and alkalimetry, permanganometry, dichrometry, iodometry and iodimetry.

Colorimetry – Beer-Lamberts law-applications.

Distribution of Marks for Complementary Elective Course

Marks including choice:

Unit	Marks	Unit	Marks
I	12	V	13
II	9		
III	6		
IV	12		

Type of Questions & Marks for External Examination- Complementary Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

COMPLEMENTARY ELECTIVE COURSE

Chemistry for Physical Science

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3C03CHE/PCH(PS)	3	2	3

Contact Hrs –54

Course Outcome

On successful completion of this course, students should be able to

CO1) Understand the basic principle underlying various spectroscopy

CO2) Understand the basic concepts of thermodynamics and laws of thermodynamics

CO3) Explain the formation , nomenclatureand applications of coordination complexes,

Illustrate the valance bond theory of coordination complexes and explain the factors

affecting the stability of complexes

CO4) Understand the basic concepts of chemical kinetics and Calculate the value of Ea from the values of k at two temperatures .Illustrate the types of Catalysis and understand the Characteristics of catalytic reactions

CO 5) Understand the basic concept of nuclear chemistry, and explain the detection of isotopes using Aston's mass spectrograph and separation of isotopes by diffusion methods
CO6) Explain the principle and applications of different types of Chromatography

Module I : Spectroscopy (9 Hrs)

Electromagnetic spectrum- Ranges of different radiation- general features of spectroscopy- Types of spectra – Rotational, vibrational and electronic spectra. Rotational spectra - Moment of inertia-rotational constant and bond length.
Vibrational spectra – stretching and bending modes-Force constant-Zero point energy.
Raman spectra – Stokes and Anti Stokes Lines – NMR spectra-chemical shift and spin-spin splitting.

Module II : Thermodynamics (8Hrs)

Basic Concepts – System – surroundings – open, closed and isolated systems – heat – energy – internal energy – Isothermal –isochoric and isobaric process – Reversible and irreversible processes- work of expansion of an ideal gas in reversible isothermal work –Heat capacity at constant volume (Cv) and at constant pressure (Cp) – relation between Cp and Cv – First law– The second law – Enthalpy-Entropy-and Free energy- significance of ΔG, ΔH and available work-Criteria for reversible and irreversible process - Gibbs –Helmholtz equation(no derivation)- criteria of spontaneous and non spontaneous processes.

Module III : Co-ordination compounds (8 Hrs)

Co-ordination compounds and complex ions –co-ordination number-Ligands – Types - unidentate- bidentate -polydentate ligands– Werners theory – Nomenclature of co-ordination compounds – Effective Atomic Number Rule – Factors affecting the stability of complex ions – valence bond theory of complexes –application of complexes.

Module IV : Chemical kinetics and catalysis (11hrs)

Definition – reaction rate – factors affecting the rate of a chemical reaction – units – Zero order reactions – Order versus molecularity. Pseudo order reactions – Integrated rate equation for first order reaction – half life – determination of the order – Half life method and Graphical method – Ester hydrolysis – rate equation. Collision theory (qualitative) Effect of temperature on reaction rate

Calculation of Ea from the values of k at two temperatures.Transition state theory (qualitative). Types of catalysis – homogeneous and heterogeneous.Characteristics of catalytic reactions – promoters and catalytic poisons. Activation energy and catalysts.

Module V : Nuclear Chemistry (10 hrs)

Concept of nuclides – representation of nuclides – isobars, isotopes and isotones with examples – Detection of isotopes using Aston's mass spectrograph – separation of isotopes by diffusion methods – stability of nucleus – n/p ratio. Liquid drop model, Radioactivity – natural and artificial. Decay constant and half-life period-Radioactive series – Group displacement law – radio isotopes and their applications in structural elucidation, in agriculture and in industry – Radiocarbon dating – Nuclear fission and nuclear fusion. Problems associated in the nuclear waste disposal. Derivation of decay constant – Atom bomb and hydrogen bomb. Mass defect, Nuclear binding energy.

Module VI: Chromatography (8 hrs)

Introduction - Adsorption and partition chromatography - Principle and applications of column, thin layer, paper, Liquid and gas chromatography, HPLC, Ion Exchange chromatography (IEC) - R_f value – Relative merits of different techniques.

Distribution of Marks for Complementary Elective Course

Marks including choice:

Unit	Marks	Unit	Marks
I	9	V	9
II	9	VI	6
III	9		
IV	10		

Type of Questions & Marks for External Examination- Complementary Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

COMPLEMENTARY ELECTIVE COURSE

Chemistry for physical science

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4C04CHE/PCH(PS)	3	2	3

Contact Hrs –54

Course Outcome

On successful completion of this course, students should be able to

CO1) Understand the basic concept in gaseous state Explain the deviation of real gases from ideal behaviorand Maxwell distribution of velocitiesand its use in calculating molecularvelocities. Distinguish average velocity, RMS velocity and most probable velocity

CO 2) Understand the basic concepts of internal structure of Crystals (crystallography) and explain X-ray analysis of crystals

CO3) Understand the basic concepts in liquid state and solutions .Illustrate Henry's law and explain its applications. Identify collegative properties and apply colligative properties to determine molecular mass

CO4) Distinguish Specific conductance – molar conductance and equivalent conductance and explain laws of electrolysis , conductometric titrations and its applications

CO5) Explain electrochemical cell ,electrode potential , types of electrodes ,EMF Nernst equation and potentiometric titration

CO6) Acquaint with various instrumental methods in chemistry and Understand basic concepts of nanochemistry

UNIT I: Gaseous State (9Hrs)

Gaseous State: Introduction - Kinetic molecular model of gases – Maxwell distribution of velocities and its use in calculating molecular velocities – Average velocity, RMS velocity and most probable velocity (derivations not required) – collision number and collision frequency, mean free path- Boyle’s law – Charles’s law – Ideal gas equation – Behaviour of real gases – Deviation from ideal behaviour - Van der Waals equation (derivation not required). Joule-Thomson effect and Liquifaction of gases .

UNIT II : Crystalline State (9 Hrs)

Solids – crystalline and amorphous solids – space lattice and unit cell- crystal planes laws of crystallography – Weiss indices and Miller indices - Bravais lattice – Bravais lattices of cubic crystals – characteristic planes in these lattices – interplanar distance ratio – X-ray analysis of crystals – Bragg's equation – problem – crystal structure of NaCl – Liquid crystals – types, properties and applications.

UNIT III: Liquid State and Solutions (10 hrs)

Liquid State: Introduction - Vapour pressure – Raoult's law- surface tension and viscosity – Explanation of these properties on the basis of intermolecular attraction.

Solutions: Kinds of solutions - Solubility of gases in liquids – Henry's law and its applications - Colligative properties - Determination of molecular mass using colligative properties.

Introduction to liquid crystals-classification and properties

Unit IV Electrochemistry(6 hrs)

Specific conductance – molar conductance and equivalent conductance – variation with dilution. Ohm's law - Conductors - metallic and ionic conductors

Electrolysis – laws of electrolysis –. Electrolytic conduction - Migration of ions – relative speed of ions – Transport number. Kohlrausch's law and applications.Conductometric titrations – advantages

UNIT V : Electromotive force (8 Hrs)

Electro chemical cell – Daniel cell – Cell reaction – Single electrode potential – statement – explanation of Nernst equation – Standard hydrogen electrode – Calomel electrode –

measurement of EMF – determination of pH using Hydrogen electrode – Potentiometric titration – concentration cells.

UNIT VI :Instrumental methods of Analysis(6 Hrs)

Principles of TGA, DTA, AAS, Spectrophotometry, Potentiometric Titration and their Applications

UNIT VII ::Chemistry of Nano Materials (6hrs)

Evolution of Nano science – Historical aspects – preparations containing nano gold in traditional medicine, Lycurgus cup – Faraday's divided metal etc.Nanosystems in nature.Preparation of Nano particles – Top – down approach and bottom – up approach, sol – gel synthesis, colloidal precipitations, Co- precipitation, combustion technique. Properties of nano particles: optical, magnetic and mechanical properties.

Distribution of Marks for Complementary Elective Course

Marks including choice:

Unit	Marks	Unit	Marks
I	10	V	8
II	7	VI	5
III	9	VII	6
IV	7		

Type of Questions & Marks for External Examination- Complementary Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

COMPLEMENTARY ELECTIVE COURSE

Chemistryfor Biological Sciences

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3C03CHE/PCH (BS)	3	2	3

Contact Hrs –54

Course Outcome

On successful completion of this course, students should be able to

CO1) i) Understand the basic concept of Coordination Chemistry, nomenclature, Werner's coordination theory and Valance bond theory of coordination complexes
ii) Write the name of Coordination compounds
iii) Explain Werner's coordination theory and Valance bond theory of coordination complexes
iv) Explain the application of coordination complexes

CO2) i) Understand the electron displacement effects in organic molecules
ii) Explain the mechanism of nucleophilic substitutions and eliminations in alkyl halides
iii)Explain the mechanism of aromatic electrophilic substitution reactions

CO3) i) Classify the isomerism in organic molecules
ii) Distinguish the geometrical isomers and explain their stability
iii) Explain the characteristics of chiral compound
iv) Explain the conformational isomers in alkanes and cycloalkanes

CO 4) i) Explain the important types of polymerization, thermoplastics and thermosetting plastics
ii) Understand the characteristics of biodegradable plastics
CO 5) Understand the basic concept of thermodynamics and laws of thermodynamics
CO6) i) Understand the basic concept of chemical kinetics
ii)Calculate Ea from the values of k at two temperatures
iii) Explain homogeneous catalysis, heterogeneous catalysis and Characteristics of catalysis reactions

UNIT I Co-ordination Chemistry(9 hrs)

Co-ordination compounds and complex ions –co-ordination number - Ligands-types - unidentate, bidentate, polydentate ligands – Werners theory – Nomenclature of co-ordination compounds – Effective Atomic Number Rule, significance – Factors affecting the stability of complex ions – valence bond theory of complexes - application of complexes.

UNIT II : Organic reaction mechanisms (10 hrs)

Classifications of organic reactions – Electron displacement effects- Inductive, Electromeric, Resonance, Hyper conjugative,Steriic effects. Mechanisms of SN_1 and SN_2 reaction.Walden inversion.Elimination reactions – E_1 and E_2 reactions. Addition of hydrohalogen acids – Markownikoff's rule – peroxide effect. Aromatic electrophilic substitution reactions - chlorination, nitration, sulphonation and Friedel Crafts reaction

UNIT III : Stereochemistry (9 hrs)

Isomerism – general – stereoisomerism – optical isomerism – chirality – plane polarized light – specific rotation – enentiomerism – recemization – diastereo isomer – optical activity of lactic acid and tartaric acid – meso tartaric acid – resolution – conformational isomerism – ethane, propane and cyclohexane – chair and boat forms- stability – geometrical isomerism – causes – maleic acid and fumaric acid – 1-butene and 2-butene stability.

UNIT IV : Introduction to Polymer Chemistry (8 hrs.)

Types of polymerization: Chain polymerization, step polymerization – homopolymers and copolymers phenol formaldehyde, urea formaldehyde polymers – Natural rubber and synthetic rubbers – Synthetic fibers– Thermoplastics and Thermosetting plastics – pollution due to plastics – Biodegradable plastics.

UNIT V : Thermodynamics (9 Hrs)

Basic concepts– System – surroundings – open, closed and isolated systems – Isothermal – isochoric and isobaric process – work – heat – energy – internal energy – Heat capacity at constant volume (Cv) and at constant pressure (Cp) – relation between Cp and Cv – First law– The second law – Enthalpy-Entropy-and Free energy-Criteria for reversible and irreversible process- Gibbs –Helmholtz equation(no derivation) concepts of spontaneous and non spontaneous processes.

UNIT VI : Chemical kinetics and catalysis (9hrs)

Definition – reaction rate – factors affecting the rate of a chemical reaction – units – Zero order reactions – Order versus molecularity. Pseudo order reactions – Integrated rate equation for first order reaction – half life – Ester hydrolysis – equation. Collision theory (qualitative) Effect of temperature on reaction rate – calculation of Ea from the values of k at two temperatures. Transition state theory (qualitative).Types of catalysis – homogeneous and heterogeneous. Characteristics of catalysis reactions – promoters and catalytic poisons. Activation energy and catalysis.

Distribution of Marks for Complementary Elective Course

Marks including choice:

Unit	Marks	Unit	Marks
I	10	V	9
II	10	VI	9
III	8		
IV	6		

Type of Questions & Marks for External Examination- Complementary Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

COMPLEMENTARY ELECTIVE COURSE

Chemistryfor Biological Sciences

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4C04CHE /PCH (BS)	3	2	3

Contact Hrs –54

Course Outcome

On successful completion of this course, students should be able to

CO1) Illustrate the preparatory methods of glucose and fructose and explain their configurations Familiarize the structure and properties of sucrose and poly sachrides

CO2) Know the structure of important five membered and six membered heterocyclic compounds

and explain their reactivity and important reactions .Explain the preparation and properties of Quinoline and iso quinoline

CO 3) Understand the structure and functions of neuclic acids , Classify amino acidsand explain the structure of protein and its importance

CO4) Understand the mechanism of enzyme action , enzyme catalysis

CO5) Know the structure of Vitamin A, B and C. and hormones progesterone, Testosterone, cortisone, adrenaline and Thyroxin

CO6) Understand the importance of metal ions in biological systems and Mechanism of O2 and CO_2 transportation – Nitrogen Fixation Na-K pump

UNIT I : Carbohydrates (9 hrs)

Introduction – Definition and classification. Preparation and properties of Glucose, Fructose and Sucrose – Mutarotation – Epimers and Anomers.D and L configuration. Conversion of glucose into fructose and fructose into glucose. Canesugar – Structure and important properties – Polysaccharides.Starch, Cellulose and Chitin – structure, properties and tests.

UNIT II : Heterocyclic compounds (10 hrs)

Introduction to Heterocyclic systems (5 membered, 6 membered and condensed systems.) Structure of pyrrole, Furan and Thiophene.Electrophilic substitution in pyrrole, Furan and Thiophene. Reactivity and orientation – Saturated 5 numbered heterocyclics – Structure and properties of pyridine. Electorphilic and nucleophilic substitution reactions in pyridine – Basicity and reduction.Quinoline and isoquinoline – preparation and properties.

UNIT III : Nucleic acids **(7 hrs)**Classification – Purine and pyrimidine bases - structure of DNA and RNA – Functions of Nucleic Acids – DNA replication –Bio synthesis of Proteins – Test for DNA and RNA. Effect of hydrogen bonding in biologicalsystems.

UNIT IV : Amino acids and proteins **(9 hrs)**

Classification of Amino acids – Physical and Chemical Properties – Zwitter ions – Iso Electric point – Sorensons formal titration – chromatographic separation of amino acids – Peptides – Proteins classification, characterization by electrolysis – Primary, Secondary and Tertiary level structures of proteins – Tests for Proteins.

UNIT V : Enzymes, Vitamins and Hormones **(10 hrs)**

Enzymes – General Nature – Mechanism of Enzyme action, Enzyme catalysis, Michaelis – Menten equation (No derivation) – Application of Enzymes, Enzyme deficiency deceases – Vitamins – Classifications structure of Vitamin A, B and C. Hormones – Classification – Structures of progesterone, Testosterone, cortisone, adrenaline and Thyroxine.

UNIT VI : Bio inorganic compounds **(9 hrs)**

Introduction - Metal ions in biological system – Metals in medicine – metal – nucleic acid interaction – biochemistry of iron – haemoglobin and myoglobin – structure and functions – Mechanism of O2 and CO2 transportation – Nitrogen Fixation Na-K pump – Bio chemistry of Zn Co and Ca in biological system.

Distribution of Marks for Complementary Elective Course

Marks including choice:

Unit	Marks	Unit	Marks
I	10	V	10
II	8	VI	8
III	6		
IV	10		

Type of Questions & Marks for External Examination- Complementary Elective Course

	Total Questions	No. Of Questions to be answered	Mark for each Question	Total Marks
Very short answer	5	5	1	5
Short answer	6	4	2	8
Short essay/Problems	5	3	3	9
Essay	4	2	5	10
	20	14		32

References:

1. Inorganic chemistry : Puri and Sharma
2. Inorganic chemistry : P.L.Soni
3. Concise inorganic chemistry : J.D.Lee
4. Basic inorganic chemistry : Cotton and Wilkinson
5. Physical Chemistry : Puri and Sharma
6. Physical Chemistry P.L.Soni and Dharmarah
7. Elements of Physical Chemistry Glasstone and Lewis
8. University Chemistry Bruce M Mahan and Rollie J Myers
9. Basic Physical Chemistry Moore W.J
10. Essentials of Physical Chemistry Bahl,Tuli and Arun
11. Advanced organic Chemistry : Jerry March
12. Organic Chemistry Morrison and Boyd
13. Environmental Chemistry A.K.De
14. Organic Chemistry Vol. 1 and II I.L.Finar
15. Polymer Chemistry Gawarikar and Vishvanadhan
16. Organic reaction mechanism : Peter Sykes
17. Organic reaction mechanism : Mukherjee and Singh
18. Organic photochemistry: Depuy and Chapman
19. Organic Spctroscopy William Kemp
20. Pragathi's Instrumental Methods of Analysis : H.Kaur

SEMESTER I, II, III & IV

4C05 CHE/PCH- COMPLEMENTARY ELECTIVE - CHEMISTRY PRACTICAL

COURSE OUTCOME

On successful completion of this course, students should be able to

CO 1) Apply the theoretical concepts while performing experiments.

CO2) Acquire practical skill to estimate acid, base, oxidizing agents etc by volumetric titration method

CO3) Acknowledge experimental errors and their possible sources.

CO 4) Design, carry out, record and analyze the results of chemical experiments

CO5) Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts

CO 6) Learns the effective usage of chemicals

1. Qualitative Inorganic Mixture Analysis

a. Reactions of cations:

Study of the reactions of the following cations with a view of their identification and confirmation.

Lead, Copper, Iron, Aluminium, Zinc, Manganese, Cobalt, Nickel, Barium, Calcium, Magnesium and Ammonium.

b. Systematic qualitative analysis of a solution containing any two of the cations given in (a) by semi micro methods.

2. Volumetric Analysis

(a) Introduction to electronic balance and analytical balance - volumetric apparatus - filtration, Equivalent and molecular mass of compounds - Normality and Molarity - Primary standards - Preparation of standard solution - Principles of Volumetric analysis.

(b.) For acidimetry, alkalimetry and permanganometry two burette method may be used and for other volumetric analyses conventional methods can be used. (Students should prepare standard solutions. The experiments should have the making up of the given solution and double titration in each experiment.

a. Acidimetry and alkalimetry - Estimation of (a) strong acids (b) strong bases (c) weak acids (d) weak bases.

b. Permanganometry ;Estimation of (a) Fe2+/FeSo4.7H2O/Mohr's salt (b) Oxalic acid

c. Dichrometry

Estimation of (a) Fe2+ using internal indicator (b) Fe3+ after reduction with stannous chloride/HC1

d. Iodimetry and iodometry

Estimations of (a) copper (b) potassium dichromate and (c) Potassium permanganate.

VIVA VOCE

References

1.	A Text Book of Qualitative Analysis	A.I.Vogel
2.	Semi micro Qualitative Analysis	V.V.Ramanujan
3.	A Text Book of Quantitative inorganic	A.I.Vogel
4.	Practical chemistry for B.Sc Chemistr y	A.O.Thomas

MODEL QUESTION COMPLEMENTARY CHEMISTRY PRACTICAL

Time : 4 Hours

Credit: 4 Total 32 marks

1. Identify and confirm the two Cations in the given solution by systematic

qualitative analysis. Submit a record of your tests, observation and inferences along with the report.

2. Determine the amount of HNO_3 in the Whole of the given solution You are

provided with Pure Crystalline $H_2C_2O_4 .2H_2O$ and Approximately N/10 NaOH Solution.

3. In the first ten minutes,

(a.) Write a brief outline of the procedure you would adopt for the estimation of Copper in the given solution of Copper Sulphate, given With A.R. potassium dichromate and N/10 Sodium thiosulphate.

(b) Calculate the mass of crystalline Copper Sulphate required to prepare
200 ml 0.2 N Solution.

4. Viva Voce

Pattern of Question paper for U.G Core Courses (Chemistry)-Theory
KANNUR UNINERSITY

Reg. No.:
Name:

---------(Semester).........(Programme)

..........(Course code).........(Course title)

Total marks: 40

Time: 3hrs.

Answer the questions in English only

Section A

(very short answer type - Each carries 1 mark -Answer all 4 questions)

1. ………………………

2. ………………………

3. ………………………

4. ………………………

[4x1=4 marks]

Section B

(Short answer type - Each carries 2 mark -Answer 7 questions out of 10)

5. ………………………

6. ………………………

7. ………………………

8. ………………………

9. ………………………

10..………………………

11. ………………………

12. ………………………

13. ………………………

14. ………………………

[7x2=14 marks]

Section C

(Short essay/problem type - Each carries 3 mark -Answer 4 questions out of 6)

15. ………………………

16. ………………………

17..………………………

18. ………………………

19..………………………

20. ………………………

[4x3=12 marks]

Section D

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

21..………………………

22..………………………

23. ……………………….

24..………………………

[2 x 5= 10 marks]

Pattern of Question paper for U.G Complementary Courses (Chemistry)-Theory

Reg. No.:

Name:

---------(Semester).........(Programme)

..........(Course code).........(Course title)

Total marks: 32Time: 3hrs.

write only in English

Section A

(very short answer type - Each carries 1 mark -Answer all 5 questions)

1.

2.
3.
4.
5.

Section B

(Short answer type - Each carries 2 mark -Answer 4 questions out of 6)

6.

7.
8.
9.

10.

11.

Section C

(Short essay type - Each carries 3 mark -Answer 3 questions out of 5)

12.

13.

14.

15.

16.

Section D

(Long essay type - Each carries 5 mark -Answer 2 questions out of 4)

17.

18.

19.

20.

Pattern of Question paper for U.G Generic Elective Course

Reg. No.:

Name:

---------(Semester).........(Programme)

..........(Course code).........(Course title)

Total marks: 20Time:2 hrs.

Answers can be written only in English

Section A

(very short answer type- Each carries 1 mark -Answer all 5 questions)

1.

2.
3.
4.
5.

Section B

(Short answer type - Each carries 2 mark -Answer 3 questions out of 5)

6.

7.
8.
9.

10.

Section C

(Short essay type - Each carries 3 mark -Answer 3 questions out of 5)

11.

12.

13.

14.

15.

KANNUR UNIVERSITY
(Abstract)

B.A. Economics/ Development Economics Programme- Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

ACADEMIC BRANCH

No.Acad.C1/12530/2019 Dated, Civil Station P.O., 20 .06. 2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated,10-10-2017

2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.

3. U.O. No.Acad.C2/429/2017 Vol.II dated,03-06-2019.

4. The Minutes of the Meeting of the Board of Studies in Economics (UG) held on 07.06.2019

5. Letter and Syllabus of B.A. Economics/ Development Economics Programme , Submitted by the Chairperson, Board of Studies in, Economics (UG) dated , 15.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies ,Workshops, discussions etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Economics (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.A.Economics/ Development Economics Programmes to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Economics (UG) submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.A. Economics/ Development Economics Programmes for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper (Core/Complementary Elective/Generic Elective Course) of B.A Economics/ Development Economics programmes under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.A Economics/ Development Economics Programmes are uploaded in the University website. (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-

DEPUTY REGISTRAR(ACADEMIC)
For REGISTRAR

To
The Principals of Colleges offering B.AEconomics/ Development Economics Programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Economics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, ECONOMICS (UG)

SYLLABUS FOR B A PROGRAMME IN ECONOMICS/DEVELOPMENT ECONOMICS CORE, COMPLEMENTARY ELECTIVE COURSE AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY
PROGRAMME OUTCOMES (PO)

PO1. Critical Thinking

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO2. Effective Citizenship

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO3. Effective Communication

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO4. Inter disciplinarity

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Economic science has become one of the most dynamic and complex disciplines across natural, physical and social sciences. Its scientific as well as dynamic character has strengthened not only the scope of economics but positively contributed to other streams of knowledge as well. The new BA syllabi of Kannur University have greater scope for using mathematical and statistical techniques, apart from theory and policy. Further it has become more interdisciplinary or/ and multidisciplinary in terms of methods of enquiry and modes of analysis. In the revised syllabi we have incorporated new frontiers of economics such as gender economics, economic geography, economic history, heterodox economics, econometrics and mathematical economics. These interdisciplinary /multidisciplinary areas will strengthen the integrated knowledge profile of the students. Restructuring was done under the initiative of Kannur University and the active involvement of the Members of the Board of Studies in Economics (UG) through a series of deliberations and discussions. In order to make it more participatory and democratic, we have organized a two day workshop to finalize the restructured curriculum and the outcome based syllabi for the BA Economics Programme. Undergraduate economics teachers of all colleges affiliated to Kannur University have actively participated in the workshop and made significant contributions towards the Outcome Based Under Graduate Education. Apart from teachers of affiliated colleges, faculty members of national repute have been invited as resource persons to streamline the syllabi in terms of method, content, and integrity of its epistemology. The basic objective of the revised syllabi is to equip our undergraduates to face the academic and real life challenges in the fast changing world tuned by knowledge revolution, science, technology, research and development. We believe that the revised curriculum and syllabi may open new horizons of knowledge and meet the vision and mission of higher education in the country. It is our privilege to introduce the revised curriculum and syllabi before the fresh undergraduates who are getting enrolled in June 2019 onwards and other stake holders of Economics Undergraduate Education.

Dr. A. Ashokan
Chairperson
Board of Studies, Economics (UG)
Kannur University

Kannur University
Programme Specific Outcome of B.A Economics / Development Economics Programme

The revised curriculum and syllabi of BA Economics Programme of Kannur University provide a structure of core courses, complementary elective courses and generic elective courses. Diversified course structure will contribute towards all round development of the student. The undergraduate programme in economics borrows ideas and techniques from a variety of other disciplines including history, geography, mathematics, statistics, management and environmental science. An undergraduate programme with sound footing in economic theory and empirics would equip the students to a range of career options in the field of economics, finance, commerce, entrepreneurship and management. The specific outcomes of the programme are summarized below:

1. The programme with structured curricula will support the academic development of the undergraduates.
2. The programme will provide the students with the opportunity to pursue courses that emphasize quantitative, qualitative and theoretical aspects of economics.
3. The programme will provide a well resourced teaching learning environment for the students of economics, which will definitely lead to the ultimate educational goal of "learning to be".
4. The programme will promote academic writing, critical thinking and research aptitude among the students.
5. Needless to point out, the students will gain a source of livelihood by expanding their skill set and widening their knowledge horizon.

INDEX

KANNUR UNIVERSITY
B A ECONOMICS PROGRAMME
WORK AND CREDIT DISTRIBUTION STATEMENT

(BA: Common English: 22, Additional Common: 16, Core: 64,
First Complementary Elective: 8, Second Complementary Elective: 8, Generic Elective: 2)

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	**Common English I**	**4**	**5**	**20**	**25**
	Common English II	**3**	**4**		
	Additional Common I	**4**	**4**		
	Microeconomic Analysis I	**5**	**6**		
	Complementary I	**4**	**6**		
II	**Common English III**	**4**	**5**	**19**	**25**
	Common English IV	**3**	**4**		
	Additional Common II	**4**	**4**		
	Microeconomic Analysis II	**4**	**6**		
	Complementary II	**4**	**6**		
III	**Common English V**	**4**	**5**	**21**	**25**
	Additional Common III	**4**	**5**		
	Central Themes in Indian Economy	**5**	**5**		
	International Economics	**4**	**4**		
	Complementary III	**4**	**6**		
IV	**Common English VI**	**4**	**5**	**20**	**25**
	Additional Common IV	**4**	**5**		
	Research Methods and Techniques for Economic Analysis	**4**	**5**		
	Environmental Economics	**4**	**4**		
	Complementary IV	**4**	**6**		
V	**Generic Elective Course**	**2**	**2**	**22**	**25**
	Basic Tools for Economic Analysis I	**4**	**6**		
	Heterodox Economics	**4**	**4**		
	Macroeconomic Analysis I	**4**	**5**		
	Development Economics	**4**	**4**		
	Economics of Banking and Finance	**4**	**4**		
VI	**Basic Tools for Economic Analysis II**	**4**	**6**	**18**	**25**
	Macroeconomic Analysis II	**4**	**5**		
	Public Economics	**4**	**5**		
	Basic Econometric Analysis	**4**	**6**		
	Project	**2**	**3**		
	Total			**120**	**150**
	Total Marks for Economics Programme	**1525**			

PART A:

ECONOMICS CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTR	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS (EXT+INT)
1 B 01ECO	MICRO-ECONOMIC ANALYSIS I	I	6	5	3	40+10=50
2 B 02 ECO	MICRO-ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3 B03 ECO	CENTRAL THEMES IN INDIAN ECONOMY	III	5	5	3	40+10=50
3 B04 ECO	INTERNATIONAL ECONOMICS	III	4	4	3	40+10=50
4 B05 ECO	RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS	IV	5	4	2+1*	30+10+10* =50
4B06 ECO	ENVIRONMENTAL ECONOMICS	IV	4	4	3	40+10=50
5D 01ECO	GENERIC ELECTIVE	V	2	2	2	20+5=25
5 B07 ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS I	V	6	4	3	40+10=50
5 B08 ECO	HETERODOX ECONOMICS	V	4	4	3	40+10=50
5 B 09ECO	MACROECONOMIC ANALYSIS I	V	5	4	3	40+10=50
5 B10 ECO	DEVELOPEMNT ECONOMICS	V	4	4	3	40+10=50
5 B11ECO	ECONOMICS OF BANKING AND FINANCE	V	4	4	3	40+10=50
6 B12 ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS II	VI	6	4	3	40+10=50
6 B13 ECO	MACROECONOMIC ANALYSIS II	VI	5	4	3	40+10=50
6 B14 ECO	PUBLIC ECONOMICS	VI	5	4	3	40+10=50
6 B15 ECO	BASIC ECONOMETRIC ANALYSIS	VI	6	4	3	40+10=50
6 B16 ECO	PROJECT**	VI	3	2	PROJECT EVALUATION	**25+25=50
	TOTAL			66		825

*Computer practical

** 25 marks each for Internal and External evaluation

PART A:

DEVELOPMENT ECONOMICS CORE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS
1 B 01 DEV ECO	MICRO-ECONOMIC ANALYSIS I	I	6	5	3	40+10=50
2 B 02 DEV ECO	MICRO-ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3 B03 DEV ECO	THEORIES OF ECONOMIC DEVELOPEMNT	III	5	5	3	40+10=50
3 B04 DEVECO	INTERNATIONAL ECONOMICS	III	4	4	3	40+10=50
4 B05 DEVECO	RESEARCH METHODS AND TECHNIQUES FOR ECONOMICS ANALYSIS	IV	5	4	2+1*	30+10+10*=50
4B06 DEVECO	ENVIRONMENTAL ECONOMICS	IV	4	4	3	40+10=50
5D 01 DEV ECO	GENERIC ELECTIVE	V	2	2	2	20+5=25
5 B07 DEV ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS I	V	6	4	3	40+10=50
5 B08 DEV ECO	HETERODOX ECONOMICS	V	4	4	3	40+10=50
5 B 09 DEVECO	MACROECONOMIC ANALYSIS I	V	5	4	3	40+10=50
5 B10 DEV ECO	DEVELOPMENT PLANNING: TOOLS AND TECHNIQUES	V	4	4	3	40+10=50
5 B11 DEV ECO	ECONOMICS OF BANKING AND FINANCE	V	4	4	3	40+10=50
6 B12 DEV ECO	BASIC TOOLS FOR ECONOMIC ANALYSIS II	VI	6	4	3	40+10=50
6 B13 DEV ECO	MACROECONOMIC ANALYSIS II	VI	5	4	3	40+10=50
6 B14 DEV ECO	PUBLIC ECONOMICS	VI	5	4	3	40+10=50
6 B15 DEV ECO	BASIC ECONOMETRIC ANALYSIS	VI	6	4	3	40+10=50
6 B16 DEV ECO (PROJECT)	PROJECT**	VI	3	2	PROJECT EVALU-ATION	**25+25=50
	TOTAL			66		825

*Computer practical

** 25 marks each for Internal and External evaluation

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT1 EXAM	50%	
COMPONENT 2 ASSIGNMENT/ SEMINAR	50%	

*Any two components, Attendance shall not be a component

PART A:
ECONOMICS/DEVELOPMENT ECONOMICS:
COMPLEMENTARY ELECTIVE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

SL NO.	COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HRS	MARKS
1	1 C 01ECO/ DEV ECO	MATHEMATICS FOR ECONOMIC ANALYSIS I	I	6	4	3	40+10=50
2	2 C 02 ECO/ DEV ECO	MATHEMATICS FOR ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3	3 C03 ECO/ DEV ECO	MATHEMATICAL ECONOMCIS I	III	6	4	3	40+10=50
4	4 C04 ECO/ DEV ECO	MATHEMATICAL ECONOMCIS II	IV	6	4	3	40+10=50
5	1 C05 ECO	INTRODUCTORY ECONOMICS I (FOR NON-ECONOMICS PROGRAMMES ONLY)	I	6	4	3	40+10=50
6	2 C06 ECO	INTRODUCTORY ECONOMICS II (FOR NON-ECONOMICS PROGRAMMES ONLY)	II	6	4	3	40+10=50
7	3 C07 ECO	HISTORY OF ECONOMIC THOUGHT I	III	6	4	3	40+10=50
8	4 C08 ECO	HISTORYOF ECONOMIC THOUGHT II	IV	6	4	3	40+10=50
9	1 C 09ECO	POPULATION AND DEVELOPEMNT	I	6	4	3	40+10=50
10	2 C10 ECO	ECONOMIC GEOGRAPHY	II	6	4	3	40+10=50
11	3 C11ECO	AGRICULTURAL ECONOMICS	III	6	4	3	40+10=50
12	4 C12 ECO	GENDER ECONOMICS	IV	6	4	3	40+10=50

ECONOMICS/DEVELOPMENT ECONOMICS:
LIST OF GENERIC ELECTIVE COURSES (ANY ONE OUT OF FIVE)
WORK AND CREDIT DISTRIBUTION

COURSE CODE	**COURSE TITLE**	**SEMESTER**	**HOURS/ WEEK**	**CREDIT**	**EXAM HOURS**	**MARKS (EXT+INT)**
5 D 01 ECO/ DEV ECO	BASICS OF ECONOMICS	**V**	2	2	2	20+5=25
5 D 02 ECO/ DEV ECO	DEVELOPMENT ISSUES OF INDIAN ECONOMY	**V**	2	2	2	20+5=25
5 D 03 ECO/ DEV ECO	KERELA ECONOMY	**V**	2	2	2	20+5=25
5 D 04 ECO/ DEV ECO	FUNDAMENTALS OF BUDGET	**V**	2	2	2	20+5=25
5 D 05 ECO/ DEV ECO	INDIAN ECONOMY IN THE POST-REFORM PERIOD	**V**	2	2	2	20+5=25

CORE COURSE I: MICROECONOMIC ANALYSIS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1B01 ECO/ DEV ECO	6	5	3

COURSE OUTCOME

The Course Outcomes are the knowledge and skills the student acquire at the end of a course.

1. A strong theoretical and empirical foundation in economics which produces employable graduates and has scope for a variety of opportunities for higher education in economics and related disciplines.
2. Students familiarity about the tool box of micro economics will enhance the capacity for understanding the functioning of economies.
3. A thorough knowledge and theoretical understanding of the foundations of modern economic analysis

Module I Introduction to Micro Economics

Scope and Subject Matter of Microeconomics, Difference between micro and macro economics- Use and limitations of micro economics- Economic model- uses, application and limitations. Scarcity and choice-PPC (15 hrs)

Module II Demand and Supply Analysis

Demand function- Law of demand- Reasons for the downward slope of the demand curve -Exceptions to the law of demand- Change in demand and change in quantity demanded- Elasticity of demand- Types-price elasticity- Income elasticity- Cross elasticity-advertising elasticity - factors affecting price elasticity - methods of measurement of elasticity - Supply- determinants- Law of supply- Changes in supply- Elasticity of supply. Concepts of equilibrium (static, dynamic, comparative static, stable, unstable, neutral, partial, general) Market Equilibrium — Price Ceilings and Price Floors (25 hrs).

Module III Theory of consumer behavior

Water diamond paradox -Cardinal approach(Marshallian)-Assumptions, Law of diminishing marginal utility, Law of equi- marginal utility – solution to water diamond paradox – Ordinal approach- Assumptions-Indifference curve and its properties-consumer equilibrium by using indifference curve analysis- Price effect, Income and substitution effects -splitting (decomposition) price effect into income and substitution effects: (Hicks and Slutsky)- Effect of change in price and income on consumer equilibrium(Price consumption curve and Income consumption curve)-Engel curve- Consumer surplus Cardinal and Ordinal measurement- Behaviorist approach - Revealed preference theorem of Samuelson – distinction between weak and strong ordering. Hicks' logical ordering (38 hrs).

Module IV Production and cost

Production function–-short run (law of variable proportion) and long run (returns to scale) production function -Economies and diseconomies of scale - Iso-quants and Iso-cost analysis– Least cost input combination (Producer‘s equilibrium) - Expansion path – Theory of cost-Traditional and modern- Linear programming (Graphical method) (30 hrs)

Books for Study

1. Dwivedi, D. N. (2002) Microeconomics: Theory and Applications. Pearson Education India.
2. Varian, H. R. (2014) Intermediate Microeconomics with Calculus: A Modern Approach, WW Norton & Company.
3. Mankiw, N. G. (2002) Microeconomics, Worth Publishers
4. Pindyck, R. S., Rubinfeld, D. L and Prem L.Mehta (2013). Microeconomics. Boston: Pearson.

Books for Reference

1. Salvatore, D. (2008) Microeconomics: Theory and Applications. OUP.
2. Koutsoyiannis, A. (1975) Modern Microeconomics. Macmillan.
3. Mas-Colell, A., Whinston, M. D., & Green, J. R. (1995) Microeconomic theory (Vol. 1). New York: OUP.

CORE COURSE II: MICROECONOMIC ANALYSYS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B02 ECO/ DEV ECO	6	4	3

COURSE OUTCOME

1. Students may acquire confidence to apply the principles of micro economics to the decision making of firms and the functioning of the market.
2. Students will also be able to analyze the distributional dynamics of the economy both at the micro and the macro level

Module I Perfect competition

Market structures –classification of markets– revenue concepts -perfect competition - characteristics – firm & industry – short run and long run equilibrium of a firm and industry – shutdown point. Perfect competition and Pareto optimality (20 hrs).

Module II Monopoly

Monopoly and its features- types of monopoly –short run and long run equilibrium - price discrimination - Types- degrees of price discrimination-regulation of monopoly– Monopsony– bilateral monopoly- indeterminacy under bilateral monopoly (24 hrs).

Module III Monopolistic Competition and Oligopoly

Monopolistic competition – Features-firm and product group-non-price competition and selling costs - short run and long run equilibrium-group equilibrium- excess capacity –Oligopoly – Features of oligopoly – collusive, non- collusive and price leadership- kinked demand curve (Sweezy’s model)- Duopoly –Cournot’s model – Bertrand’s model – Chamberline’s small group model (32 hrs)

Module IV Factor Pricing and Economic Welfare

Distribution: Functional versus personal distribution - Demand for and supply of factors - concepts of total physical product (TPP) APP – VMP – MRP – marginal productivity theory of distribution – Product exhaustion theorem. Factor pricing under perfect competition and imperfect competition. Rent and Quasi rent-Ricardian theory of rent- Modern theory of rent-Theories of wages (subsistence, wage fund) Theories of interest (classical, neo classical and Keynesian) Theories of profit (dynamic, risk bearing, innovation and uncertainty). Economic welfare- criteria of welfare (GNP, Bentham, cardinal, Pareto, compensation, Bergson- Samuelson) (32 hrs)

Books for Study

1. Salvatore, D. (2008). Microeconomics: Theory and Applications. OUP.
2. Koutsoyiannis. A (1975). Modern Microeconomics. macmillan.

3. Pindyck, R. S., & Rubinfeld, D. L. (2013). Microeconomics. Boston: Pearson. .
4. Schaum's Series (2004) Outline of Microeconomics, McGraw Hills.
5. Varian, H. R. (2014). Intermediate Microeconomics with Calculus: A Modern Approach. WW Norton & Company
6. Mankiw, N. G. (2010). Microeconomics, Worth Publishers

Books for reference

1. Dwivedi, D. N. (2002). Microeconomics: Theory and Applications. Pearson Education
2. Varian, H. R. (1977). Intermediate Microeconomics, Workbook Solution Manual

CORE COURSE III: CENTRAL THEMES IN INDIAN ECONOMY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B03 ECO	5	5	3

COURSE OUTCOME

1. To help the students to identify the basic structure and working of Indian economy by enabling them to use qualitative and quantitative data relating to various economic issues and policies.
2. Students may get an opportunity to identify the strategic drivers in the development of Indian Economy.
3. It will create an environment to comprehend and critically appraise the current problems and policies relating to Indian economy.

Module I- India in the Global Scenario

Basic features of Indian Economy- Structural Changes in Indian Economy- A critical evaluation of Five Year Planning in India- NITI Ayog: Structure, Objectives and functions- Economic Reforms: Liberalisation, Privatization, Globalisation and its impacts- India as an Emerging Economic Power. Demonetization and its impact on Indian economy. (20 hours)

Module II -Role of Agriculture, Industry and Service Sector

Role of agriculture: contribution to GDP, employment and international trade- Problems of Indian Agriculture- Causes of low productivity- New Agricultural Strategy: Green Revolution, Evergreen Revolution - WTO and Indian Agriculture. Role of industries in the Economic development of India- Problems of Public sector enterprises – Problems of Small Scale and Cottage Industries- New Industrial Policy 1991: its impact on Industrial Development in India. Role of Service Sector in the Indian Economy- Recent trends in India’s Foreign Trade. (35 hours)

Module- III -Emerging Development Issues

Poverty- Meaning, concepts and types - Extent of poverty in India- Poverty Eradication Programmes.

Unemployment- Meaning, concepts, types and causes of unemployment- Work Participation Rate- Magnitude of Unemployment in India. Inequality; Meaning and types- Regional inequality; Causes and remedies. (15 hours)

Module IV -Kerala Economy

Unique Features of Kerala Economy- Demographic indicators- Agricultural Stagnation- Industrial Backwardness- Current issues in education, health and energy sectors- Decentralized Planning- Migration and Foreign Remittance- Problem of Aging- Women Empowerment. (20 hours)

Books for Study

1. Misra, S. K., & Puri, V. K. (2011). Indian Economy, Himalaya Publishing House.
2. Dutt, R., & Sundaram, K. P. M. (2008). Indian Economy, S Chand New Delhi.
3. Agrawal, A. N. (2015). Indian Economy. New Age International Pvt.
4. Kapila, U. (2009). Indian Economy: Performance and Policies. Academic Foundation.
5. Kapila, U. (Ed.). (2017). Demonetization: The Economists Speak. Academic Foundation.
6. Jalan, B. (2004). Indian Economy. Penguin UK.
7. Ashokan, A(2009) Perspectives of Health Economics, Serials Publication New Delhi

Books for Reference

1. Thirlwall, A. P. (1994). Growth and Development: With Special Reference To Developing: with Special Reference to Developing Economies. Macmillan International Higher Education.
2. Joshi, V, Little, I. M. D., & Little, I. M. D. (1996). India's Economic Reforms, 1991-2001. OUP.
3. Ishwar, D. C. (2010). Indian Economy–Environment and Policy.
4. Desai. B, (2008) Industrial Economy in India, Himalaya Publishing House, Mumbai.
5. Parayil, G., & Sreekumar, T. T. (2003). Kerala's Experience of Development and Change. Journal of Contemporary Asia, 33(4), 465-492.
6. Franke, R. W. (2001). Local Democracy and Development: People's Campaign for Decentralized Planning in Kerala. Leftword.
7. R.K Lekhi & Joginder Singh (2010) Agricultural Economics, Kalyan Publishers. New Delhi.
8. Oommen, M. A. (1993). Essays on Kerala economy. Oxford & IBH Publishing Company.
9. Rangarajan, C., & Kannan, R. (2004). Select Essays on Indian economy (Vol.1). Academic Foundation.
10. Kapila, U. (Ed.). (2009). Indian Economy Since independence. Academic Foundation.
11. Dutt, R., & Sundaram, K. P. M. (2008) Indian Economy, S Chand,New Delhi.

12. Basu, K. (Ed.). (2004). India's Emerging Economy: Performance and Prospects in the 1990s and Beyond. MIT press.
13. Prakash, B. A. (Ed.). (2012). The Indian Economy Since 1991: Economic Reforms and Performance, 2/e. Pearson Education India.
14. Jalan, B. (2012). Emerging India: Economics, Politics, and Reforms. Penguin
15. Jalan, B. (2004). Indian Economy. Penguin UK.
16. Jeffrey, R. (2016). Politics, Women and Well-being: How Kerala became a model'. Springer.
17. George, K. K. (1999). Limits to Kerala Model of Development: An analysis of fiscal crisis and its implications. Centre for Development Studies. Thiruvananthapuram

DEVELOPMENT ECONOMICS CORE COURSE III:

THEORIES OF ECONOMIC DEVELOPMENT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B03 DEV ECO	5	5	3

Course outcomes

1. To know the determinants and measurement issues relating to growth and development
2. To enable students to understand the theories and strategies of growth and development
3. To provide basic understanding about the developmental challenges faced by LDCs
4. To provide a general outlook on various policy issues in development.

Module I: Introduction to Development Economics

Defining the concepts of Economic growth and Economic development , Structure and characteristics of developing nations, Vicious circle of poverty both on demand and supply side-Basic requirement of development - Measures of economic growth-Gross Domestic product, Per capita income concepts –limitations .Measures of economic development- Human Development index and other indices of development (PQLI, GDI, HPI, MPI, GEM, Green Index, Global Hunger Index, Global happiness index etc), Recent trends in human development indices , Core values of development (Denis Goulet), Amrithya Sen's capability approach. Development gap.

(17 Hours)

Module II: Determinants of development:

The role of capital in development: Sources of capital, Capital formation, capital –output ratio, Natural capital: supply of land and other natural resources, Human capital: Education and health indicators , Human capital formation and manpower planning, Technological progress and development, Capital intensive and labour intensive, intermediate technology, Growth of population and development, Theory of demographic transition, Role of institutions in development, Basic concepts in gender and development-sex and gender-Women in Development(WID) and Women and development(WAD)

(20 hours)

Module III: Theories of Growth and development.

Theories of Adam Smith, David Ricardo and Malthus, Marx's stages of Growth and Marxian theory of economic development-Schumpeter's theory-Rostow's stages theory, Big push theory, Critical minimum effort theory, Nelsons low level equilibrium trap theory, Lewi's model of unlimited supply of labour, Disguised unemployment as a saving potential-Theories of Nurkse, Vakil and Brahmananda, Balanced and Unbalanced growth theories, Harrod –Domar and Solow swan Growth models (35 hours)

Module IV: Policies for Development

Role of monitory and Fiscal policies in economic development, inward and outward oriented foreign trade policies and its impact on development. Role of industrial and agricultural policies on development, Role of foreign aid and foreign capital on economic development.

(18)

Books for study

1. A P Thirlwall,(2006) *Growth and Development, with Special Reference to Developing Countries,* Palgrave Macmillan,
2. A N Agarwal and S P Singh (1958), *The Economics of Underdevelopment*, OUP
3.Misra and Puri(2007): Economics of Development and Planning –Theory and Practice, Himalaya Publishing House, New Delhi
4. Todaro, Michael, P (1993); Economic Development in the Third World, Orient Longman, Hyderabad.

Books for References

1. Meir, Gerald, M (1990) Leading Issues in Economic Development –OUP Delhi.
2. Adelman Irma (1962): Theories of Economic Growth and Development, Stanford University Press, California.
3. Sen, Amartya (1982) Poverty and Famines, OUP.
4. Nurkse, Ragnar(1957) Problems of Capital formation in Under Developed Countries, Monthly Review Press, Newyork
5. Agarwal, R.C (2004) Economics of Development and Planning –Theory and Practice, Lakshmi Narain Agarwal Educational Publishers, Agra
6. Utsa Patnaik, *Trends in urban poverty under economic reforms: 1993-94 to 2004-05*, EPW, Vol-XLV No.4, January 23, 2010.
7. Kaushik Gangopadhyay and Kamal Singh, Extent *of poverty in India A different Dimension,EPW V*ol-XLVIII No.06, February 09, 2013
8. Radhicka Kapoor, *Inequality matters*, EPW Vol-XLVIII No. 02, January 12, 2013
9. Himanshu, T*owards new poverty lines for India*, EPW, Vol-XLV, No.01, January 02, 2010
10. UNDP Reports

CORE COURSE IV: INTERNATIONAL ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3B04 ECO/ DEV ECO	4	4	3

COURSE OUTCOME

1. Enabling the students to assess current international economic issues based on theory and evidence.
2. Preparing the students to undertake higher studies and research in issues related to International Economics
3. Students may get an opportunity to examine the trends in global economic performance

MODULE I: Introduction to International Economics – Meaning, nature and contents of International economics. Importance of the study of International economics, International and Inter regional trade, tools in trade theory- indifference Curve, Production Possibility Curve- community Indifference Curve. Theories of absolute advantage, Comparative advantage, Opportunity cost theory, Reciprocal demand theory, Heckscher - Ohlin theory – criticisms. Empirical tests of trade models- Leontief Paradox (18 hours)

MODULE II. Terms of Trade – Terms of trade and its importance, classification of TOT, Commercial policy – Free trade vs protection- Methods of trade restrictions – Tariff barriers and non tariff barriers – Types of tariff, effect of tariff, methods of non tariff barriers – Quotas , Export subsidies, Voluntary Exchange restraints, International cartels, Dumping, technical, administrative and other measures. WTO and Free trade agreements (19hours)

MODULE III. Foreign Exchange – Foreign exchange market and its structures. The foreign exchange rate fixed and flexible, exchange rate regime in India, theories of exchange rate Termination , the Mint Parity theory, the Purchasing Power Parity theory, Demand and supply analysis (17 hours)

MODULE IV. Balance of Trade and Balance of Payments –Meaning and definition, structure of BOP- Current account and Capital account- balance of payment equilibrium and disequilibrium- Causes of disequilibrium – corrective measures- automatic and deliberate measures. The Brettonwoods system and IMF – Role of IMF to address the BOP disequilibrium – India’s BOP since 1991 (18 hours)

Books for Study

1. Feenstra, R. C., & Taylor, A. M. (2010). *Essentials of International Economics*. Macmillan.
2. Obstfeld, M., & Krugman, P. R. (2003). *International Economics: Theory and Policy*. Addison-Wesley/Pearson.

3. Appleyard, D. R., Field Jr, A. J., Cobb, S. L., & Lima, A. F. (2010). International Economics, McGraw Hill.

Books for Reference

1. Salvatore, D(2009) International Economics , OUP

2. Miltiades Chacholiades(2012) International Economics, McGraw-Hill

3. Sodersten, B., & Reed, G. (1980). International Economics, St. *Martin's Press, New York*.

4. Henry Thompson (2010) International Economics, Global Markets and Competition, Cambridge University Press India Pvt Ltd

5. Thomas Pugel (2010) International Economics, McGraw-Hill

6. Vaish, M. C., & Singh, S(1990) International Economics, Oxford, IBH

CORE COURSE V
RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	**4B 05 ECO/ DEV ECO**	**5**	**4**	**2+1***

*computer practical

COURSE OUTCOME

1. To initiate students to the field of academic research.
2. Introduce quantitative, qualitative and analytical tools required to prepare small research projects.
3. To bridge the gap between theory and empirics and to familiarize the use and importance of data in research
4. To highlight the importance of scientific research in economics based on academic honesty, integrity and ethics

Module I:

Introduction: Importance of academic research in Economics. Positive science and Normative- deductive and inductive methods -Problems of Research in Social Sciences: Quantification, Organizing Controlled Experiments, Replication and Verification; Criteria of Good Research. Research Methods: Social Survey, Case Study, Experimental Method, Econometric Method. (Definition, Features, Importance and Limitations) (23 hours*)*

Module II:

Basics of Research in Economics –Significance of Theory and Hypothesis. The research Design: Steps in Research Process & Structure of Research Report-Identification of research problem-review of literature- framing research questions-hypothesis formation. (18 hours)

Module III:

Academic Report Writing: Preparation of Synopsis; Explaining the Research Problem and Preparation of Bibliography; Notations and Symbols; Techniques for Referencing; importance of footnotes, bibliography and references, Preparation of Articles for Journals; Books; Preparation of Abstracts.

Ethics in research: Scientific integrity, Plagiarism (definition of plagiarism- consequences of plagiarism- unintentional plagiarism- forms of plagiarism), Good reference practice, Verification and subsequent use of research material. (22 hours*)*

Module IV

Empirical Investigations: Sources of Primary and Secondary Data; Census and Sampling Methods; Economic Statistics in India. Major Sources of data.NAS and NSSO -Data structure, key concepts and variables- Data portal of RBI (12hours)

Written examination will be based on first four modules only. (30 marks) Practical examination based on fifth module for 10 marks

PRACTICAL

This introduces the student to the process extraction, analysis and presentation of data towards drawing statistical inferences. The students will be introduced to important data sources that are available in India and will be trained in the use of free statistical software to analyse data.

Module V:

Elementary calculations: Measures of central tendency and dispersion: Forms of presentation of data: trend line, charts and graphs. Growth rates; Method of Splicing and Deflating Series. Modes of referencing. Specific Styles- APA and MLA (students are encouraged to use free software packages) (15 hrs)

Books for Study

1. Ranjith Kumar (2014): Research Methodology: A Step-by- Step Guide for Beginners, Sage.
2. Goode, William J. and Hatt, P.K(1980) Methods in Social Research, McGraw Hill, New Delhi
3. Uwe Flick (2012): Introducing Research Methodology: A Beginner's Guide to Doing a Research Project, Sage.
4. Ross, R. (1974): Research: An Introduction, Barnes & Noble Books, New York.
5. Kothari, C. R., and Garg, G. (2019). Research Methodology: Methods and Techniques.

Books for Reference

1. Kurien, C. T, (ed.1973) A Guide to Research in Economics. Sangam Publishers for Madras Institute of Development Studies, Madras
2. CORE THE ECONOMY : Economics for A Changing World, Available at: http://www.core-econ.org/
3. National committees for research Ethics in Norway, Guidelines for Research Ethics in the Social Sciences, Law and the Humanities, 2006
4. MLA Handbook for writers of Research Papers, East-West Press Pvt .ltd, New Delhi, 2009.
5. Informatics Technology in action, Pearson, Dorling Kindersley, 2011
6. Gilbert, Norma (1981): Statistics, Holt-Saunders, Japan
7. Bernard (1966): Statistics in Research, Oxford & IBH, Mumbai.

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CORE COURSE VI: ENVIRONMENTAL ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B06 ECO/ DEV ECO	4	4	3

COURSE OUTCOME

1. To provide a deeper understanding about the interface between ecology and economy.

2. Understand the economic incentives to improve and conserve the environment.

3. To provide basic conceptual understanding of environmental disaster, its management and mitigation

4. Ultimately, greater awareness will be imparted about the issues of environmentally sustainable development in an interdisciplinary perspective.

Module I: Introduction to Environmental Economics

Meaning, need, nature and scope of environmental economics –Environment and Ecology- Environment and Economy interaction: Material Balance Model-the laws of thermodynamics– Environment and Ethics: Approaches – Bio centric and Anthropocentric **(13 hours)**

Module II: Natural Resources and Sustainable Development

Renewable and exhaustible resources- Resource taxonomy – Sustainable development: meaning, weak and strong sustainability, approaches and indicators, threats to sustainable development – Issues of natural resources related to forest resource, water resources, energy resources, food resources and land resources – Need for conservation of natural resources **(17 hours)**

Module III Market Failure and Externalities

Public Good: Meaning and features – Environmental quality as a public good – Externalities: Positive and Negative externalities – Market failure in the presence of externalities – free rider problem – Common Property Resources – Tragedy of Commons: Coase theorem and Property Rights – Abatement of externalities: Emission Standards, Pigouvian tax and Subsidies**(20 hours)**

Module IV Climate Change, Pollution and Disaster Management Climate Change and its impact: Green house effect and Global Warming, Acid Rain, Ozone layer Depletion, Loss of Bio diversity and Desertification –

i) Types of Pollutions: Air, Water, Noise, Soil, Marine, Thermal, Nuclear pollution, Solid Waste and E-waste – Major Environmental issues in Kerala: consumerism and waste products, land sliding, sand mining and laterite stone mining. – Environmental awareness movements in India (Silent Valley and Narmada Bachao movements) –

ii) Disaster Management: concepts of hazard, risk, vulnerability and disaster, types and classification of disasters, importance and relevance of disaster management in the present environmental scenario **(22 hours)**

Note: compulsory field visit to various eco spots/ecologically sensitive places NOT MORE THAN 5 days. Report of field visit may be considered as assignment of this paper.

Books /Reports for Study:

1. Kolstad, C. (2011). Intermediate Environmental Economics: International Edition. OUP
2. Callan, S. J., & Thomas, J. M. (2013). Environmental Economics and Management: Theory, Policy, and Applications. Cengage Learning.
3. Rabindra N. Battacharya, (2008) Environmental Economics: An Indian Perspective, OUP
4. Barry C Field,(2012) Natural Resource Economics: An Introduction, Waveland Press, Inc
5. Subhashini Muthukrishnan, (2015) Economics of Environment, PHI Private Limited, Delhi
6. On disaster management, visit at:

   i).https://ndma.gov.in/images/policyplan/dmplan/National%20Disaster%20Management%20Plan%20May%202016.pdf; Web: www.ndma.gov.in

   ii) Chaminda Pathirage, Krisanthi Seneviratne, Dilanthi Amaratunga and Richard Haigh (2014) Knowledge factors and associated challenges for successful disaster knowledge sharing, Global Assessment Report on Disaster Risk Reduction, Centre for Disaster Resilience, University of Salford.

Books for Reference

1. Tom Tietenberg (2004) Environmental and Natural Resource Economics, Pearson
2. Vinod K. Sharma (1999) Disaster Management. National Centre for Disaster Management, IIPE, New Delhi
3. Nick Hanley, Jason F Shogren & Ben White (1997), Environment Economics: Theory and Practice. Macmillan India Ltd
4. Singh Katar and Shishodia A (2007) Environmental Economics, Theory and Applications, Sage Publication.
5. John Asafu-Adjaye (2005) Environmental Economics for Non-economists: Techniques and Policies for Sustainable Development. World Scientific Publishing Pvt. Co.
6. Barry C Field and Martha K Field (2010), Environmental Economics-An Introduction, McGraw Hill.

CORE COURSE VII:
BASIC TOOLS FOR ECONOMIC ANALYSIS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5 B0 7ECO/ DEV ECO	6	4	3

COURSE OUTCOME

1. To enable the students to understand economic concepts with the aid of mathematical and Statistical tools.
2. To equip the students to quantify economic variables and to enable them to apply statistical techniques in Economics.
3. To analyze and interpret empirical data with the help of statistical tools

Module I: Elementary Mathematics

Number system, laws of indices, logarithm, arithmetic and geometric progressions, compound growth rate. Equations: linear and quadratic equations and their solution. Applications in economics – market equilibrium (28 hours).

Module 2: Elementary Set theory and economic functions: Set theory: Concept, types, operations, Cartesian product-Functional relations and functions-graphs- application in economics. Cost, revenue, total product, average cost, demand and supply curves, PPC Curve –indifference curve –isoquant. (24 hours).

Module 3: Introduction to Statistics: Meaning, definition of statistics- role of statistics in economics-Collection of data: types of Data – Census and Sampling-Types of sampling. Classification of data-tabulation. Presentation of data: Histograms, polygon, frequency curves, bar and pie diagrams. Analysis and interpretation of data: Measures of central value: Mean, Median, Mode, Geometric Mean and Harmonic Mean-partition values-Measures of Dispersion: Range, Quartile deviation, Mean deviation and Standard Deviation-Lorenz Curve and Gini Coefficient and its economic application- Skewness and Kurtosis (40 hours).

Module 4: Basic Probability: Meaning and approaches, definition of probability, addition theorem, conditional probability, independence of events and multiplication theorem (Simple examples) (16 hours)

Books for Study

1. Allen, R.G.D. (1980) Mathematical Analysis for Economists, Palgrave MacMillan.
2. Monga G.S. (2007), Mathematics and Statistics for Economists, Vikas Publishing House, New Delhi.
3. Mehta and Madnani(2000), Mathematics for Economists, Sultan Chand & Sons, New Delhi
4. Gupta S.P(1996): Statistical Methods, Sultan Chand& Sons, New Delhi

5. S. C. Gupta (1999) Fundamentals of Statistics, Himalaya Publishing House, Delhi.

Books for Reference

1. Veerachamy R. (2005), Quantitative Methods for Economics, New Age International (P) Limited Publishers, New Delhi.
2. Dowling, E.T (2006): Introduction to Mathematical Economics, Schaum's Online Series, McGraw Hill, New Delhi.
3. Chiang, A.C (2005): Fundamental Methods of Mathematical Economics, McGraw Hill.
4. Taro Yamane (1996): Mathematics for Economists: An Elementary Survey, Prentice Hall.
5. Agarwal, D.R (1995): Mathematics for Economics, Vrinda Publications, Delhi.
6. Yule and Kendall (1984): An Introduction to the Theory of Statistics, Charles Gtiffin & Co, London.
7. Spiegel, M.R (2000): Theory and Problem of Statistics, McGraw Hill, London.

CORE COURSE VIII:
HETERODOX ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5 B08ECO/ DEV ECO	4	4	3

Course Outcome

1. Familiarity with different perspectives of alternative schools of thought may get easily exposed to pluralistic approach to both economic theory and policy.
2. Through such an exposure the course will enhance and diversify the knowledge profile of the students and may get opportunities to pursue higher studies and research in heterodox economics.

Module 1 Features and Limitations of Mainstream Economics

Features of Mainstream or Orthodox Economics – rationality – optimizing behaviour of economic agents - existence of equilibrium- central role of market- Critique of Mainstream Economics –- imperfect information- market failure- role of government- role of institutions (15 hrs)

Module 2 An Introduction to Heterodox Economics

Definition, Nature and Scope Principles and teaching of Heterodox Economics –Brief history of heterodox economics

(10 hrs)

Module 3 Foundations of Heterodox Economics: Marx and Veblen

Economic ideas of Marx – Dialectical Materialism-Modes of production- historical evolution of human society- labour theory of value- accumulation of capital- immiserization of proletariat- Concentration and centralisation of capital-decline in profit and crises of capitalism- current relevance of Marxism-Marx as a heterodox economist.

Veblen's Old Institutionalism- evolution and role of institutions-conspicuous consumption and leisure class- role of business enterprises- similarities of ideas between Veblen and Marx (28 hrs)

Module 4 New Developments in Heterodox Economics

i) Institutionalism-Keynesian revolution-Schumpeter's economic ideas- behavioural economics - feminist economics - ecological economics – neuro-economics (brief descriptions only)

ii) Evolution of Heterodox Economic ideas in India- Gandhian economics (19 hrs).

Books for study

1. Mearman, A., Berger, S., & Guizzo, D. (2019). *What is Heterodox Economics?: Conversations with Leading Economists*. Routledge.
2. Slaughter, C. (1985). Marx and Marxism, Orient Longman.
3. Ashokan.A (2019) An Introduction to Heterodox Economics(forthcoming)

4. Lee, F. (2009). *A History of Heterodox Economics: Challenging the Mainstream in the Twentieth Century*. Routledge.
5. Albelda, R (2016). *Alternatives to Economic Orthodoxy: Reader in Political Economy:* Routledge.
6. Sweezy, P. M. (1970). *Theory of Capitalist Development*. Monthly Review Press.
7. Jo, T. H., & Lee, F. (Eds.). (2015). *Marx, Veblen, and the Foundations of Heterodox Economics: Essays in Honor of John F. Henry*. Routledge.

Books/Reports for Reference

1. Jo, T. H., Chester, L., & D'Ippoliti, C. (Eds.). (2017). *The Routledge Handbook of Heterodox Economics*. London: Routledge.
2. Barker, D., & Kuiper, E. (2003). *Toward a Feminist Philosophy of Economics*. Routledge.
3. Power, M. (2012). A History of Heterodox Economics. *On the Horizon* ,Vol. 20 Issue: 3, pp.253-259, https://doi.org/10.1108/10748121211256847
4. Samuels, W. (Ed.). (2002). *The Founding of Institutional Economics*. Routledge.
5. CORE THE ECONOMY : Economics for A Changing World, Available at: http://www.core-econ.org/
6. Heilbroner, R. L. (2011). *The Worldly Philosophers: The Lives, Times and Ideas of the Great Economic Thinkers*. Simon and Schuster.
7. Fischer, L., Hasell, J., Proctor, J. C., Uwakwe, D., Perkins, Z. W., & Watson, C. (Eds.2017). *Rethinking Economics: An Introduction to Pluralist Economics*. Routledge.

CORE COURSE IX
MACROECONOMIC ANALYSIS -I-

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B09 ECO/ DEV ECO	5	4	3

COURSE OUTCOME

1. Students will be able to get a perspective on the working of an economy.
2. By sharpening the macroeconomic tool box students will be able to appreciate macroeconomic policies.
3. Enables the students to pursue higher studies in the core domain of economics.

Module I: Definition of Macroeconomics – Evolution of Macroeconomics (Classical, Keynesian and Post – Keynesian) – Circular and cyclical trends of Macroeconomic variables (endogenous and exogenous, dependent and independent, ex-ante and ex-post, stock and flow) – Circular flow of income and Expenditure in two, three and four sector economies. (15Hrs)

Module II : Classical model of full employment – Assumptions of Classical economics – Say's law of markets- Fischer's equation of exchange- Real theory of interest- wage-price – interest flexibilities- saving-investment equality- labour market – money market – commodity market – neutrality of money – classical dichotomy – criticisms of classical theory. (20 Hrs)

Module III: Keynesian model of underemployment equilibrium – wage-price rigidity – meaning, definition and types of unemployment – consumption function – Saving function – investment function — MEC and MEI- interest elasticity of investment – Keynesian model of income determination (two sector, three sector and four sector) – Investment multiplier, Balanced budget multiplier and foreign trade multiplier – Inflationary gap and deflationary gap –Instruments of Fiscal Policy and Monetary Policy. (30 Hrs)

Module IV: Keynesian and Post – Keynesian consumption theories – Theory of consumption puzzle - Absolute, Relative, Permanent and Life cycle hypotheses – autonomous and induced investment–Accelerator theory of Investment. (25Hrs)

Books for Study:

1. Dornbusch, R., Fisher, S., & Startz, R. (2001). Macroeconomics. Eight Ed.
2. Froyen, R. T., & Perez, S. J. (1990). *Macroeconomics: Theories and policies* , Pearson
3. Rangarajan, C.& Dholakia, B. H. (1979). *Principles of Macroeconomics*. Tata McGraw-Hill Education
4. Turner P. (1993) Modern Macroeconomic Analysis, McGraw-Hill.
5. Errol D'Souza (2008) Macro Economics – Pearson Education.

Books for Reference:

1. Mankiw, N. G. (2002). Macroeconomics Worth Publishers.
2. Levačić, R., & Rebmann, A. (1982). An Introduction to Keynesian-neoclassical Controversies
3. Heijdra B., van der Ploeg F. (2002) Foundations of Modern Macroeconomics, OUP.
4. CORE THE ECONOMY The Economy Economics For A Changing World, Available at: http://www.core-econ.org/
5. Amit Bhaduri(1995) Macroeconomics: Dynamics of Commodity Production, MacMillan

CORE COURSE X:
DEVELOPMENT ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B10ECO	4	4	3

COURSE OUTCOME

1. To make the students aware of the methodological and measurement issues relating to growth and development.
2. To enable the students to understand the theory and empirics of Development Economics with special reference to less developed countries
3. To provide an understanding about the various development issues and the development gap between policy and practice.

Module 1 -Introduction to Development Economics:

Concept of growth and development- Growth vs development debate Measures of economic Growth and limitations (GDP, Per Capita Income), Measures of economic development and limitations (PQLI, HDI, GDI,GEM HPI,MPI etc) Trend assessment in human development indices, Development gap, Dennis Goulet's core values of development, Introduction to Amartya Sen's capability approach, Development gap (15 hours)

Module II- Theories of Development

Development theories: Ideas of Adam Smith, Marxian theory of development, Rostow's stage of growth theory, Schumpeter's innovation theory, Balanced and unbalanced theory: big push theory- critical minimum effort theory- Low Level of Equilibrium Trap- Arthur Lewis theory- Nurkse theory of disguised unemployment as saving potential. Wage good model of Vakil and Brahmanada (20 hours)

Module III: Growth Models

Harrods- Domar growth model - Neo- Classical Theory of Growth by Solow- Kaldor's growth model, Joan Robinson's golden rule of capital accumulation (15 hours)

Module IV: Issues in Economic Development

Poverty and economic growth, Concept and measurement of poverty, Trends in poverty in India. Measures and strategies for poverty reduction. Inequality: Meaning, measurement and extent of inequality and national level. Economic growth and inequality, Kuznets inverted U hypothesis, Trends in inequality in India. Unemployment: concept, types and status of unemployment in India. Unemployment and economic growth, Concept of inclusive growth in development (22 hours)

Books for study

1. A P Thirlwall (2006), *Growth and Development, with Special Reference to Developing Countries,* Palgrave Macmillan.

2. A N Agarwal and S P Singh (Ed.1958) *The Economics of Underdevelopment*, OUP.
3. Misra, S. K., & Puri, V. K. (1986) Economics of Development and Planning: Theory and Practice
4. Todaro, M. P. (1977). *Economic Development in the Third World: An Introduction to Problems and Policies in a Global Perspective*. Pearson Education.
5. Sen, Amartya Kumar (1970) *Growth Economics,* Penguin Education
6. Ray, D. (1998). *Development Economics*. Princeton University Press.

Books for Reference

1. Acemoglu, D., & Guerrieri, V. (2008). Capital Deepening and Non-balanced Economic Growth. *Journal of political Economy*, *116*(3), 467-498.
2. Dasgupta, P. (2007). *Economics: A Very Short Introduction*. OUP Oxford.
3. Basu, K., & Maertens, A. (2012). *The New Oxford Companion to Economics in India*. OUP.
4. Patnaik, U. (2013). Poverty trends in India 2004-05 to 2009-10: Updating poverty estimates and comparing official figures. *EPW*, 43-58.
5. Patnaik, U. (2010). Trends in urban poverty under economic reforms: 1993-94 to 2004-05. *EPW,* 42-53.
6. Gangopadhyay, K., & Singh, K. (2013). Extent of Poverty in India: A Different Dimension. *EPW*, 75-83.
7. Himanshu, R., & Sen, A. (2010). Towards New Poverty lines for India. *EPW*, *45*(1), 2-8.
8. Dasgupta, P. (2013). The Nature of Economic Development and the Economic Development of Nature. *EPW*, 38-51.
9. Mishra, P. (2013). Has India's Growth Story Withered? *EPW*, 51-59.
10. Prabahath Patnaik, *Economic Growth and Employment,* EPW, Vol: XLV1, No: 26-27, June 25, 2011.
11. Bose, A. & Chattopadhyay, S (2010). The Analytics of Changing Growth Rates, EPW 64-68.

DEVELOPEMNT ECONOMICS: CORE COURSE X:

DEVELOPMENT PLANNING: TOOLS AND TECHNIQUES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B 10 DEV ECO	4	4	3

Course outcomes

1. To equip students to the fundamentals of economic planning and implementation.
2. To know the tools and techniques of development planning and its application in the context of development
3. To impart the knowledge about the issues relating to sustainable development and environmental protection.

SYLLABUS

Module: 1: Introduction to Development Planning:

Development planning: meaning and rationale of economic planning –Types of planning-Short term, medium term and long term planning; planning by direction and planning by inducement; indicative and imperative planning; centralized and decentralized planning ;Totalitarian and Democratic planning ; Physical and Financial planning; Rolling and fixed planning. (13 hours)

Module: II: Techniques in Planning: Economic Controls in a planned economy-meaning, need, and types of economic control. Planning strategy,- Investment criteria – Need and Types Minimum Capital-Output ratio criterion , The Social Marginal Productivity criterion , Marginal Per capita Reinvestment Quotient, Marginal Growth contribution criterion , Time series criterion. Choice of techniques: Cost –Benefit analysis and Project evaluation, Uses of Input–Output analysis, Linear Programming-Role of shadow prices in planning. (25 hours)

Module: III: Economic Planning in India and Kerala: Planning in a mixed economy-Objectives and strategy of planning in a mixed economy - Plan Models- Harrod –Domar model and Mahalanobis model- Review of five year plans in India: Objectives, resource mobilization, achievements and limitations. Role of planning in a market economy. Planning in the post reform period in India, NITI Aayog: objectives, performance and critical evaluation. Decentralized governance in Kerala: People’s planning, Sustainability of Kerala model of development and emerging developmental challenges (25 hours)

Module IV: Objectives and strategies of Sustainable Development:

Sustainable Development: Brudtland Commission Report, Meaning and objectives and strategies of sustainable development, Problems of Sustainable Development, UNDP and Millennium Development goals, Report of the Club of Rome, The Earth Summit at Rio De Genero and Recent Developments. (11 hours)

Books for Study

1. Thirwal,A.P.(1994), Growth and Development-ELBS/Macmillan, London
2. Agarwal, A.N and Kundan Lal(1992)Economics of Development and Planning. Vikas Publishing House Pvt.Ltd, New Delhi
3. Todaro, Michael, P (1993) Economic Development in the Third World, Orient Longman,Hyderabad,
4. Misra and Puri(2007)Economics of Development and Planning –Theory and Practice, Himalaya Publishing House, New Delhi
5. Chakravarthy, Sukhamoy (1987) *Development Planning*, OUP

Books for Reference

1. Agarwal, R.C (2004) *Economics of Development and Planning* –Theory and Practice, Lakshmi Narain Agarwal Educational Publishers, Agra
2. Debraj Ray (1998) *Development Economics*; Oxford Indian paperbacks
3. Oommen, M.A (1993) *Essays on Kerala Economy*, Oxford IBH. New Delhi.
4. Oommen, MA (1999) *Rethinking Development* –Kerala's Development Experience Vol I&II ,Institute of Social Sciences, Concept Publishing Company, New Delhi
5. Ashok Rudra (1985), *India Plan Models*, Allied Publishers, New Delhi.
6. Govt. of India: Planning Commission's Documents.
7. Government of Kerala (2019) *Economic Review*, Kerala State Planning Board, Thiruvananthapuram.

CORE COURSE XI:
ECONOMICS OF BANKING AND FINANCE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B 11ECO/ DEV ECO	4	4	3

Course Outcome

1 The students will be equipped with theoretical as well as practical aspects of the structure and working of financial system and regulatory mechanisms.

2 The course is expected to expand the skill set of the students for higher studies and employment in finance

3 The students will be aware of the innovations and the related trends in the field of banking and finance with special reference to instruments like derivatives.

Module I Financial System:

Meaning and functions, financial intermediaries, financial markets, financial instruments. An overview of the structure of Indian financial system. (05 hours)

Module II Banking and Non- Banking Financial Institutions:

Commercial Banks- Functions, liabilities and asset structure, principles of sound lending, mechanism of credit creation, role of commercial banks in economic development. Development Banks: meaning and objectives, development banks in India: IDBI, SIDBI, NABARD. NBFIs; meaning and types. Innovations and recent trends in Indian banking sector; ATM, E-Banking, Credit cards, Debit cards, Smart cards, Internet banking, Mobile banking, Core banking, ECS, NEFTS, RTGS. An overview of banking sector reforms in India (Narasimham, Verma, P J Nayak) (36 hours)

Module III Financial Markets and Instruments:

Money market, functions, features of Indian money market. Components of money market and their instruments; call money market, commercial bill market, treasury bill market, certificate of deposits, commercial papers, interbank participation certificates, repo instruments. Capital market: features, functions, structure of Indian capital market, primary market and secondary market. Stock exchanges (BSE, NSE), stock market index. Derivative market; meaning, financial derivatives (basic concepts); forwards, futures, options, swaps. Internet trading, (23 hours)

Module IV Regulatory Mechanism:

Reserve Bank of India (RBI); functions and powers, Securities and Exchange Board of India (SEBI); objectives, powers and functions. Measures taken by RBI and SEBI to regulate the financial system in India. A brief account of the objectives of IRDAI and PFRDA. (08 hours)

Books for Study

1. Gordon, E., & Natarajan, K. (2009). Financial Markets and Services. Himalaya Publishing House.
2. Narayana Nadar, E (2016) Money and Banking, PHI Learning Private Ltd, Delhi.
3. Machiraju, H. R. (2010). Indian Financial System. Vikas Publishing House.
4. Khan, M. Y. (2013). Indian Financial System. Tata McGraw-Hill Education.
5. Varshney and Maheswari(2005)Banking Theory and Practice, S Chand & Sons
6. Sarma, V. N. (2011). Banking and financial Systems. Cambridge India.
7. Khanna, P. (2005). Advanced Study in Money and Banking: Theory and Policy Relevance in the Indian Economy (Vol. 1). Atlantic Publishers & Dist.
8. Muraleedharan, D. (2014). Modern Banking: Theory and Practice. PHI Learning Pvt. Ltd.
9. Machiraju, H. R. (2008). Modern Commercial Banking. New Age International.
10. Pathak, B. V. (2011). The Indian Financial System: Markets, Institutions and Services. Pearson Education India.
11. Gurusamy. (2009). Indian Financial System, 2E. Tata McGraw-Hill Education.
12. Pathak V V (2012) The Indian Financial System. Pearson's Education Private Ltd.

Books for Reference

1. Chandra, P. (2017). Investment Analysis and Portfolio Management. McGraw-Hill Education.
2. Bhole, L. M. (2004). Financial Institutions and Markets: Structure, Growth and Innovations, Tata McGraw-Hill Education.
3. Misra, B. S. (2010). Credit Cooperatives in India: Past, Present and Future. Routledge
4. De Kock, M.H (1976). Central Banking, Granada Publishing Limited, New Delhi
5. Preetisingh(2010)- Dynamics of Indian Financial System, Ane Books, New Delhi.
6. Chandler, L. V., & Jaffee, D. M. (1977). Regulating the Regulators: A Review of the FINE Regulatory Reforms. Journal of Money, Credit and Banking, 9(4), 619-635.
7. Sayers, R.S (1985) Modern Banking, OUP, Oxford.
8. S K Basu (1980)-Banking Theory and Practice, Macmillan.

CORE COURSE XII

BASIC TOOLS FOR ECONOMIC ANALYSIS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B 12 ECO/ DEV ECO	6	4	3

COURSE OUTCOME

1. To enable the students to understand and interpret economic concepts with the aid of mathematical and statistical tools.
2. To enable students to apply statistical techniques in Economics.
3. To analyze and interpret empirical data with the help of statistical tools

Module I: Matrices

Concepts, Types, Operation, addition, subtraction, multiplication, determinants, inverse (for 2x2 matrices only). Solution of simultaneous equations in 3 unknowns using Cramer's rule, solution of simultaneous equations in 2 unknowns using matrix inversion method, solving market equilibrium.

(18 hours)

Module II: Differential calculus

Limit and continuity (definition only), differentiation of single variable function: rules, higher order derivatives, sign and magnitude of derivatives and its interpretation – concept of slope, maxima and minima of unbounded functions. Applications of simple derivatives in economics: Elasticity of demand, Marginal Cost and Marginal Revenue. Differentiation of two variable functions: partial derivatives of first and second order- Application of Partial derivatives in economics: Demand analysis and Production analysis-Cobb-Douglas production function.

(32 hours)

Module III: Bivariate Data Analysis

Simple correlation – meaning and types and measurement – scatter diagram, Pearson's coefficient and rank correlation coefficient, interpretation. Simple linear regression – meaning, OLS method of estimation. Relationship between correlation and regression coefficients. Examples from economics: Estimation of consumption function, saving function and production function and interpretation of results. (28 hours)

Module IV: Time series analysis and Index numbers

Components of time series, measurement of trend – semi average, moving average, method of least squares. Types of index numbers – weighted and unweighted, price and quantity indices, Laspyer's, Paasche's and Fisher's index numbers. Time reversal and factor reversal tests, construction of consumer price and wholesale price indices, base shifting and splicing, deflating, uses of index numbers. (30hours)

Books for Study

1. Allen, R.G.D. (1980) Mathematical Analysis for Economists, Palgrave MacMillan.
2. Monga G.S. (2007) Mathematics and Statistics for Economists, Vikas Publishing House, New Delhi.
3. Mehta and Madnani (2000) Mathematics for Economists, Sultan Chand & Sons.
4. Gupta S.P (1996): Statistical Methods, Sultan Chand& Sons, New Delhi
5. S. C. Gupta (1999) Fundamentals of Statistics, Himalaya Publishing House, Delhi.

Books for Reference

1. Chiang, A.C (2009): Fundamental Methods of Mathematical Economics, McGraw Hill.
2. Yamane, T. (1968). Mathematics for economists: An Elementary Survey.
3. Aggarwal, D.M: Business Mathematics and Statistics, Ane Books, New Delhi.
4. Yule, G. U., & Kendall, M. G. (1968). An Introduction to the Theory of Statistics, Charles Griffin and Co. *Ltd, London.*
5. Spiegel, M. R. (2016). Schaum's Outlines Probability and Statistics.

CORE COURSE XIII:
MACROECONOMIC ANALYSIS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B13 ECO/ DEV ECO	5	4	3

COURSE OUTCOME

1. Students will be equipped with a sound idea of advancements in macro economics with tools like IS-LM and the developments there after.
2. Students will be equipped with the theories of economic fluctuations and needed policy intervention
3. Student will be able to develop critical thinking and research inquisitiveness in macro economics
4. Opportunities to higher studies and prospects for employment through the knowledge of theories and concepts in Macroeconomics will be enhanced.

Module I: Neoclassical synthesis - integration of Real and Monetary sectors – basic IS-LM model – IS curve and real sector (Derivation of the equation and curve) – LM curve and monetary sector (Derivation of the equation and curve) – General equilibrium – shifts in IS and LM curves – limitations of the basic IS-LM model. (25 hours)

Module II : Inflation and Unemployment – Inflation; meaning and types - Causes of inflation – disinflation and sacrifice ratio – interest rate and inflation (Fisher effect) – relationship between inflation and unemployment – Philips curve and U-I trade off – Stagflation and U - I trade off – Adaptive expectation – natural rate of unemployment (NAIRU) – Long run Philips curve .

(25 hours)

Module III: : Trade cycles – Meaning and definitions of trade cycles – phases of trade cycles – shorter and longer cycles – theories of trade cycles – Hawtrey's theory – Hayek's theory – Keynesian theory – Hicks theory- Samuelson's theory. (20 hours)

Module IV: Money – meaning and definition of money – Difficulties of Barter - functions of money – types of money – demand for money- Quantity theory of money – Cambridge approach - Keynesian demand for money – Restatement of quantity theory of money – Portfolio theories of money demand – Supply of money – measures of money supply in India – Inside money and Outside money – Monetary Base – Fiat money – Seigniorage – Money multiplier – Quantitative and qualitative instruments of Monetary Policy. (20 hours)

<u>Books for Study</u>:

1. Dornbusch, R., Fisher, S., & Startz, R. (2001). Macroeconomics, Mc Graw Hill
2. Froyen, Richard T(1990)Macroeconomics : Theories and Policies' – Pearson
3. Rangarajan, C., & Dholakia, B. H. (1979). *Principles of macroeconomics*. Tata McGraw-Hill Education.
4. Turner P. (1993) Modern Macroeconomic Analysis, McGraw-Hill.
5. Errol D'Souza (2008) Macro Economics – Pearson Education.

<u>Books for Reference:</u>

1. Mankiw, N. G. (2002). Macroeconomics Worth Publishers.
2. Levačić, R., & Rebmann, A. (1982). An Introduction to Keynesian-neoclassical Controversies.
3. Heijdra B., van der Ploeg F. (2002) Foundations of Modern Macroeconomics, OUP.
4. Shapiro, E. (1978). *Macroeconomic Analysis*

CORE COURSE XIV:
PUBLIC ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B14 ECO/ DEV ECO	5	4	3

COURSE OUTCOME

1. Better conceptualization of the economic rationale of govt. in terms of allocation, distribution, stabilization and growth in a federal system

2. Better exposure to resource mobilization by the govt. through innovative fiscal instruments like GST.

3. Students are expected to get an overall perspective of public policy and the development programmes aimed at public welfare as well

Module 1: Introduction

Meaning and scope of public economics - Distinction between private and public finance - Fiscal functions (Allocation, Distribution, Stabilization, Growth) - The Principle of Maximum Social Advantage - Public Goods , Private Goods, Externalities. **[18 hours]**

Module II: Public Expenditure

Meaning of public expenditure- Types (Developmental, non developmental, revenue and capital expenditure)- Canons of public expenditure- Theories of public expenditure (Wagner's law, Wiseman Peacock hypotheses)- Reasons for the growth of Public Expenditure in India- Trends in public expenditure in India **[20hours]**

Module III: Public Receipts

(a) **Tax revenue** – Meaning of tax- Canons of taxation- Classification of taxes (Direct and Indirect taxes; Progressive, Proportional, Regressive, Digressive taxes: Specific and Ad Valorem taxes) Impact, incidence and shifting of tax burden (concepts only) - Tax evasion and tax avoidance - Transition of Indirect tax system in India- GST in India and its features- Major trends in tax revenue of the government of India.

(b) **Non- tax revenue** – Commercial Revenue, Administrative Revenue, Gifts and Grants.

(c) **Public debt**: Meaning - Sources of public borrowing- Classification of public debt- Methods of repayment of public debt - Trends in public debt of India. **[28 hours]**

Module IV: Constitutional Mechanisms in India

(a) **Budget** - Meaning- Classification (Surplus and deficit budget, Performance, Programme and Zero Base Budgeting) - Budgetary procedures in India- Major budgetary deficit concepts

(Revenue deficit, fiscal deficit, primary deficit and monetized deficit) - Major highlights of the current year's Budget: India and Kerala.

(b) **Fiscal Federalism**: Meaning of fiscal federalism-Principles of federal finance- Finance commission: Functions of finance commission, Major recommendations of latest finance commission. **[24 hours]**

Books for Study

1. Jha, R. (2009). *Modern Public Economics Second Edition*. Routledge.
2. Musgrave, R. A., Musgrave, P. B., & Bird, R. M. (1989). *Public Finance in Theory and Practice* (Vol. 5). New York: McGraw-Hill.
3. Stiglitz, Joseph E and Jay K. Rosengard (2015) Economics of the Public Sector, WW Norton & Co
4. Herber, B. P. (1979). Modern Public Finance, Richard D. Irwin INC, Illinois.
5. Holley H. Ulbrich (2011) Public Finance in Theory and Practice, Routledge.

Books for Reference

1. Dalton, H. (2013). *Principles of Public Finance*. Routledge.
2. Myles, G. D. (1995). *Public Economics*. Cambridge University Press.
3. Gupta, J. R. (2007). *Public Economics in India Theory and Practice*. Atlantic Publishers.
4. Mithani, D. M. (1998). Modern Public Finance: Theory and Practice. *Himalaya House*.
5. Singh, S. K. (2008). *Public Finance in Theory & Practice*. S. Chand.
6. Tyagi, B. P (2010).Public Finance, Jai Prakash Nath & Co.
7. Rana, K.C & Varma, K.N (2005) A Study in Public Finance.
8. Mithani, D. M. (1998). Modern Public Finance: Theory and Policy. *Himalaya House*.

CORE COURSE XV:
BASIC ECONOMETRIC ANALYSIS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B15 ECO/ DEV ECO	6	4	3

COURSE OUTCOME

1. This course provides a comprehensive introduction to basic econometric concepts, methodology and techniques of analysis.
2. The Students will acquire knowledge and adequate skills for the development of simple linear econometric models.
3. The students will be able to perform econometric analysis relating to their project work and future research and development.

Module I: Introduction to Econometrics

Definition and Scope of Econometrics - Division of Econometrics: Theoretical and Applied Econometrics-Methodology of Econometrics- Stochastic and Non-stochastic relations-Limitations of Econometrics. (24 Hours)

Module II: Linear Regression Analysis

Simple regression analysis:-Population regression function- Sample Regression Function- The Method of Ordinary Least Squares(OLS)-Assumptions of OLS-Properties of OLS estimators-The Gauss-Markov theorem-Coefficient of determination (r^2)-interpretations of regression coefficients– Hypothesis testing –Null and Alternative Hypothesis –Type I error and Type II errors- Level of significance and degrees of Freedom- Basic form of Multiple linear regression model. (35 Hours)

Module III: Violation of Classical Assumptions of Regression Model

Multi-collinearity: Meaning, Causes and Consequences of Multi-collinearity- Detection and Remedial measures. Autocorrelation: Meaning, Causes and Consequences of Autocorrelation – Detection of Autocorrelation (Graphical method and the Durbin-Watson Test)-Remedial measures. Heteroscedasticity: Meaning, Causes and Consequences- Detection of Heteroscedasticity (The Glejser test and Goldfeld-Quandt Test) –Remedial measures. (35 hours)

Module IV: Basic Econometric Applications

Linear Regression models: Demand function – Non-linear regression models: Cobb-Douglas Production function (basic forms only). (14 hours)

Books for Study

1. Gujarati, D. N. (2004). Basic Econometrics. The McGraw– Hill Companies.
2. Koutsoyiannis, A. (1977). *Theory of Econometrics: An Introductory Exposition of Econometric Methods,* Macmillan
3. Studenmund.A.H (2017) Using Econometrics: A Practical Guide, Pearson Education Limited.

Books for Reference

1. Nachane, D. M. (2006). Econometrics: Theoretical Foundations and Empirical Perspectives. *OUP*.
2. Lodha, S., & Soral, G (2016). Evidence for Seasonality and Changes in Seasonal Trends in Indian Stock Market. *IUP Journal of Applied Finance*, *22*(3), 87.
3. Greene, W. H. (2003). Econometric Analysis, Prentice Hall. New Jersey, 16.
4. Gujarati,Damodar (2015): Econometrics by Example, Palgrave Macmillan, New York.
5. Wooldridge.M. Jeffrey (2009) Econometrics, Cengage Learning India Pvt. Ltd. New Delhi.
6. Griffiths, W. E., Hill, R. C., & Judge, G. G. (1993). Learning and Practicing Econometrics. John Willey and Sons. *Inc. New York, USA*.

CORE COURSE XVI:
PROJECT WORK

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B 16 ECO/DEV ECO	3	2	EXTERNAL PROJECT EVALUATION

The students are directed to identify a relevant project topic in economics or related areas during the V semester itself and approval from the Head of the Department is mandatory. After getting the approval of the project proposal from the Head, they will work on it under the supervision of the concerned faculty members. Students are further requested to complete review of literature, field work, questionnaire, if any, during the V semester itself. Only the writing part may be earmarked for the VI semester. This is for the timely completion and improving the quality of the work. It is the duty of the HoDs to ensure the above procedures.

Project Guidelines

1. Approval of the project proposal by the head of the Department
2. Title of the project
3. Introduction
4. Research Objectives
5. Research Questions
6. Review of Literature
7. Methodology and Methods
8. Results and Interpretation
9. Conclusion
10. Bibliography/References
11. Appendix
12. The project work is a team/ group work. Each group shall not exceed five members. The students should ensure that the work is original. It should follow proper reference style, preferably APA style. Two hard copies of the project report should be submitted to the Department on or before February 15.
13. Project valuation: A panel of experts appointed by the university to evaluate the project report at the CV camp (external evaluation =25 marks) and internal evaluation based on Viva Voce exam as per the university norms (internal valuation= 25 marks). The Project work will be treated as a full course and total marks is 50. An examiner may evaluate only 7 projects per day: Four projects in the FN and Three projects in the AN. Remuneration for project evaluation may be fixed by the University.

The time frame and stages of completion of the project work are summarized in table 1. The procedures and other details regarding the project work are summarized in table 2.

Table 1 Stages of Completion of the Project work

Time Period	Activities	Guide's remarks	Signature of student	HoD
June	Assignment of guide, Preliminary discussions, Selection of the broad area of study.			
July to Mid August	Literature Survey - Formulation of the Problem- Setting up of objectives and Chalking out the methodology			
End of August	Presentation of the Synopsis and finalization of the Topic and Title			
September	Data Collection			
November	Tabulation and Data Analysis			
December	Midterm Evaluation to review the progress of the Project			
January first week	Submission of the draft report			
February first week	Final draft			
February Second Week	Oral/ Poster Presentation and internal Viva			
On or before February 15	Project submission			

Table 2 Three Stage Evaluation Scheme for Project assessment

RUBRIC FOR UG PROJECT ASSSSEMENT (3 Stage Evaluation Scheme)						
			I Stage	**II Stage**	**III Stage**	
Sl No	**Domain**	**PROCESS**	**Internal**	**Mid-term Evn. Seminar/ poster**	**Final External @ CV Camps**	**Total**
1	**Planning & Design**	Preliminary Discussion Leading to Choice of Topic and Problem	2	4	5	**11**
		Construction/ definition of Problem				
		Literature Survey / Basic Reading				
		Identifying the Problem (and also its clarity)				
		Choice of Data and their Sources				
2	**Methodology**	Sampling Design in case of primary Data & Finalization of Data Set and sources in case of Secondary Data	2	3	7	**12**
		Analytical tools & its Suitability				
		Tabulation & Analysis				
3	**Analysis & Discussion of the Results**	Mid-term Review of the progress	2	4	8	**14**
		Discussion of Result & Validation of the Objectives				
		Summary &Suggestions/ policy recommendations				
4	**Final Report & oral/ Poster Presentation**	Final Project & Oral/ Poster Presentation	4	4	5	**13**
		Reference /Bibliography				
		Overall Scientific approach and Academic Commitment				
		TOTAL	**10**	**15**	**25**	**50**

* Frequency of discussion and finalization of the decisions and timely completion of the each stage must be verified by the guide
** It is not the end results alone but the involvement and commitment of the students in the completion must also equally be valued.

PART B:
ECONOMICS/DEVELOPMENT ECONOMICS:
COMPLEMENTARY ELECTIVE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

SL NO.	COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDT	EXAM HRS	MARKS
1	1 C 01ECO/ DEV ECO	MATHEMATICS FOR ECONOMIC ANALYSIS I	I	6	4	3	40+10=50
2	2 C 02 ECO/ DEV ECO	MATHEMATICS FOR ECONOMIC ANALYSIS II	II	6	4	3	40+10=50
3	3 C03 ECO/ DEV ECO	MATHEMATICAL ECONOMCIS I	III	6	4	3	40+10=50
4	4 C04 ECO/ DEV ECO	MATHEMATICAL ECONOMCIS II	IV	6	4	3	40+10=50
5	1 C05 ECO	INTRODUCTORY ECONOMICS I (FOR NON-ECONOMICS PROGRAMMES ONLY)	I	6	4	3	40+10=50
6	2 C06 ECO	INTRODUCTORY ECONOMICS II (FOR NON-ECONOMICS PROGRAMMES ONLY)	II	6	4	3	40+10=50
7	3 C07 ECO	HISTORY OF ECONOMIC THOUGHT I	III	6	4	3	40+10=50
8	4 C08 ECO	HISTORYOF ECONOMIC THOUGHT II	IV	6	4	3	40+10=50
9	1 C 09ECO	POPULATION AND DEVELOPEMNT	I	6	4	3	40+10=50
10	2 C10 ECO	ECONOMIC GEOGRAPHY	II	6	4	3	40+10=50
11	3 C11ECO	AGRICULTURAL ECONOMICS	III	6	4	3	40+10=50
12	4 C12 ECO	GENDER ECONOMICS	IV	6	4	3	40+10=50

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

INTERNAL ASSESSMENT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT 1 EXAM	50%	50%
COMPONENT 2 i)Assignment ii) Seminar/Viva -	50%	50%

*Any two components, Attendance shall not be a component

COMPLEMENTARY ELECTIVE COURSE 01: MATHEMATICS FOR ECONOMIC ANALYSIS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1	1C 01 ECO/ DEV ECO	6	4	3

COURSE OUTCOME

1. Students will be equipped with the basics of mathematical tools and their application for better understanding and interpretation of economic theory.
2. This course is expected to provide students with an elementary introduction to mathematical concepts that are used in the study of economics at UG level.
3. The basic outcome of the course will be the enhancement of skills in applying mathematical concepts that are indispensable for in depth study of theoretical as well as empirical economics.

Module I Functions and Graphs in Economics

Constants and Variables, Concept of Function - Classes and types of Functions: Single valued and multi-valued, single variable and multi-variable, increasing and decreasing, convex and concave functions. Quasi concavity and monotonicity, Graph of functions: linear, quadratic and cubic, logarithmic, exponential functions and their graphs. Economic functions: Demand function, Supply function**,** Cost function, Revenue function, Profit function, Utility function, Consumption function, Production function, saving function, Investment function (30 hours)

Module II Differentiation of Single Variable functions

Limit and Continuity of Functions - Some important limits - Point continuity and interval continuity -Properties of continuous functions – Derivative and differentiation- Rules of differentiation - Higher Order derivatives - L' Hospitals' rule - Application of Derivatives in economics- Marginal analysis-Unconstrained Maxima and Minima of functions (38 hours)

Module III Differentiation of multi Variable functions

Derivatives and Differentials - Partial and total derivatives, Total differential - Higher order Derivatives and differentials - Homogeneous function - properties - Constrained optimization - Lagrange multiplier method. Application of Multivariable differentiation in economics: Marginal analysis (40 hours)

Books for Study

1. Edward T Dowling (2001):Introduction to Mathematical economics, Schaum’s outline series, McGraw –Hill international edition
2. Srinath Barauh (2010) Basic Mathematics and its Application in Economics, Amanad, New Delhi
3. Peter J Hammond & Knut Sydsaeter (2010) Mathematics for Economic Analysis, Pearson

Books for Reference

1. Allen. R.G.D (1956): Mathematical Analysis for Economists, Macmillan
2. Yamane, Taro (2004): Mathematics for Economists: An Elementary Survey, PHI, New Delhi
3. Chiang. A.C (1988): Fundamental Methods of Mathematical Economics, McGraw Hill.

COMPLEMENTARY ELECTIVE COURSE 02: MATHEMATICS FOR ECONOMIC ANALYSIS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1I	2C 02 ECO/ DEV ECO	6	4	3

COURSE OUTCOMES

1. The course will provide the basics of mathematical tools for analyzing economic theory.

2. The analytical ability of students in dealing with economic theories and concepts is expected to be enhanced by involving in calculus and matrix algebra

Module I: Integral Calculus

Concept of integration - Integral of single variable function –Indefinite integration- Rules of indefinite Integrals- Integration by substitution and integration by parts –Economic applications of indefinite integration: relationship between total and marginal values- present and discounted values- Definite integral-Properties of definite integration, Economic applications of Definite integration :Area under curve and area between curves- consumer's surplus and producer's surplus

(38 hours)

Module II Matrix Algebra - I

Definition of matrix - types of matrices - operation on matrices –-determinants – properties of determinants –inverse of a matrix - Cramer's rule - Gauss elimination method - solving a system of linear equations (40hours)

Module III Matrix Algebra - II

Linear independence and rank of matrix - characteristic root or Eigen value –quadratic functions- The discriminants and Sign definiteness of quadratic functions- Optimization conditions of quadratic forms subject to linear constraints. (30 hours)

Books for Study

1. Dowling E.T (2003) Introduction to Mathematical Economics, 2nd Edition, Schaum‘s Outline Series, McGraw-Hill, New York.
2. Chiang A.C. and K. Wainwright (2013) Fundamental Methods of Mathematical Economics, Tata McGraw-Hill Education; Fourth edition
3. Allen R.G.D (1976) Mathematical Economics 2 ed., Macmillan
4. Boumol. W. J (1987) Economic Theory and Operations Analysis, 4 ed., Prentice Hall of India.

Books for Reference

1. Colell, A. Mas et. Al (1991) Microeconomic Theory, Harvard University Press.
2. Hands, D.W. (1991) Introductory Mathematical Economics, D.C. Heath.
3. Handy, S.T. (1997) Operations Research, Prentice-Hall of India, New Delhi.

Mukherji, B. and V. Pandit (1982) Mathematical Method of Economic Analysis, Allied Publishers, New Delhi.

COMPLEMENTARY ELECTIVE COURSE 03:
MATHEMATICAL ECONOMICS-I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3 C03 ECO/ DEV ECO	6	4	3

COURSE OUTCOMES

1. Understanding of the basic mathematical concepts and tools will be improved.
2. Students will be able to conceptualize economic problems mathematically and develop skills in applying mathematical tools and techniques in microeconomic theory.

Module I Introduction to Mathematical economics

Meaning and scope of Mathematical Economics – Role of mathematics in economics- Mathematical formulation of economic theories (Law of demand, Law of supply)- Variables, constant and coefficients- Limitation of Mathematical Economics (18 hours)

Module II Theory of Consumer Behaviour

Consumer equilibrium- Utility function- - Cardinal and ordinal utility approaches – Indifference curves and its mathematical properties- Constraint Maximization (First and second order conditions)- Demand functions –Ordinary and compensated demand functions - Elasticity of demand- Price elasticity, income elasticity and cross elasticity of demand –- Derivation of Slutsky equation – Cases of normal, inferior and Giffen goods (29 hours)

Module III Theory of Producer Behaviour

Production function - Homogeneous and non-homogeneous production functions –Cobb-Douglas and CES functions– Elasticity of substitution – Constraint output maximization and cost minimization- Revenue and cost functions- Profit maximization (first and second order condition)- Relationship between AR, MR and elasticity of demand.(45 hours)

Module IV Price and Output Determination

Equilibrium of firms under different market structures- perfect competition and monopoly- Price and output determination under discriminating monopoly.(16 hours)

Books for Study:

1. Henderson, James M and Quandt, R E (1980): Microeconomic Theory: A Mathematical Approach, McGraw Hill Book Company.
2. Heathfield D.F and Wibe, Soren (1987): "An Introduction to Cost and Production Functions" Macmillan.
3. Dowling E.T(2003), Introduction to Mathematical Economics, Schaum's Outline Series, McGraw-Hill, New York

Books for Reference:

1. Allen, R.G.D. (1974) Mathematical Analysis for Economists, Macmillan Press, London.
2. Chiang, A.C. (1986) Fundamental Methods of Mathematical Economics (3rd Edition), McGraw Hill, New Delhi.
3. Colell, A.Mas et.al (1991) Microeconomic Theory, Harvard University Press.
4. Hands, D.W. (1991) Introductory Mathematical Economics, D.C. Heath.
5. Handy, S.T. (1997) Operations Research, PHI, New Delhi.
6. Mukherji, B. and V. Pandit (1982) Mathematical Method of Economic Analysis Allied Publishers, New Delhi.

COMPLEMENTARY ELECTIVE COURSE 04:
MATHEMATICAL ECONOMICS-II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4C 04 ECO/ DEV ECO	6	4	3

COURSE OUTCOMES:

1. The course will provide an understanding of the fundamental concepts of linear programming, input output analysis and game theory and their applications in economics.

2. It will enhance the capacity of the students in recognizing an economic variable with the help of mathematical tools

Module: I Linear Programming

Concept – Basic assumptions - Formulation of LPP – Solution to LPP : Graphic method, Extreme point theorem, solutions to maximization and minimization problems – Simplex method : Solutions to maximization problems – Duality in LPP – Formulation of dual – Characteristics – Economic interpretation of dual – Applications and limitations of linear programming. (45 hours)

Module II Input – Output Analysis

Concept – Main features – Assumptions - Technical coefficients and Technological matrix – Open and Closed model – Static and Dynamic model – Solutions to two sector and three sector models – Technological viability and Hawkins – Simon conditions – Applications and Limitations of input output analysis. (40 hours)

Module III Game Theory

Fundamental concepts- – Two person zero sum game – Solution of pure strategy games : Maximin and Minimax strategy, Saddle point – Solution of mixed strategy problems : Arithmetic method – Principle of dominance – Graphic method – Transforming game to LPP - Concept of Nash equilibrium and Prisoner's Dilemma. (23 hours)

Books for Study

1. Dowling E.T (2003) Introduction to Mathematical Economics, 2nd Edition, Schaum‘s Outline Series, McGraw-Hill, New York.
2. Chiang A.C. and K. Wainwright (2013) Fundamental Methods of Mathematical Economics, Tata McGraw-Hill Education; Fourth edition
3. Allen R.G.D (1976) Mathematical Economics 2 ed., Macmillan
4. Boumol. W. J (1987) Economic Theory and Operations Analysis, Prentice Hall of India.

Books for Reference

4. Colell, A. Mas et. Al (1991) Microeconomic Theory, Harvard University Press, Cambridge.
   Hands, D.W. (1991) Introductory Mathematical Economics, D.C. Heath.
5. Handy, S.T. (1997) Operations Research, Prentice-Hall of India, New Delhi.
   Mukherji, B. and V. Pandit (1982) Mathematical Method of Economic Analysis, Allied Publishers, New Delhi.

COMPLEMENTARY ELECTIVE COURSE 05:
INTRODUCTORY ECONOMICS -I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1	1C 05 ECO	6	4	3

COURSE OUTCOME

1. The students will get an overall background of the economic theory
2. Specific inputs from micro economics covering the fundamental concepts will improve their analytical skills

Module I: Introduction to Economics

Definition of Economics- Micro and macro economics- Scarcity and choice-Production possibility curve-Central problems of an Economy-Role of price mechanism (20 hrs)

Module II: Demand analysis

Law of Demand-Elasticity of demand-price, cross and Income elasticity of Demand-Measurement of elasticity of demand -Cardinal Utility approach-Law of Diminishing Marginal Utility-consumers surplus-Ordinal utility- Indifference Schedule -Indifference curve Analysis- Properties of Indifference Curve (20 hrs)

Module III: Theory of production, cost and revenue

Production function-factors of production - Laws of production-Short run (Law of variable proportions)-Long run (Returns to scale)-Economies and diseconomies of Scale-Cost function - Types of costs-cost curves(TC,TFC,TVC,AVC,AFC,AC,MC)-Revenue and Revenue curves(TR,AR and MR) (28 hrs)

Module IV: Market forms and Distribution theory

i) Perfect Competition and its features- Equilibrium of the firm in short run and long run-Monopoly and its features-price and output determination under Monopoly-Price discrimination-Monopolistic competition and its features -price and output determination under Monopolistic Competition.

ii) Marginal productivity theory of distribution- Rent and Quasi rent Wages-Nominal and real wages- subsistence wages- Interest-natural and market rate of interest- profits-Gross and Net profits (40 hrs)

Books for study

1. Mankiw, Gregory N(2008)Microeconomics, Worth Publishers
2. Koutsoyiannis(2010) A Modern Microeconomics, MacMillan
3. Dominik Salvatore (2010) Principles of Microeconomics, Oxford, International Student Edition.

Books for Reference

1. Dwivedi, D.N(2002): Microeconomics: Theory and Applications, 2nd Ed., Pearson, New Delhi
2. Watson and Getz (2011) Price Theory and its Uses‘, New Delhi: AITBS Publisher.

COMPLEMENTARY ELECTIVE COURSE 06:
INTRODUCTORY ECONOMICS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2C 06 ECO	6	4	3

COURSE OUTCOME

1. To familiarize the students about the subject matter of economics mainly relating to concepts in macro economics and public finance.
2. Students are expected to get an awareness of the development issues of Indian economy with special reference to poverty, inequality, unemployment and black economy.

Module I: National Income Accounting

Concepts of National income [GNP/GVA, NNP, NI, Personal Income, Disposable Income, per-capita income] Computation of NI- Methods and Difficulties (20 hrs)

Module II: Money and Banking

Barter system -Meaning of money-type, role and functions of money -functions of commercial banks- Central Banks - Role and functions of RBI--Instruments of credit control-Quantitative methods [Bank rate, open market operations, Repo rate, Reverse repo rate, CRR, SLR] - Qualitative or selective credit control methods. (24 hrs)

Module III: Public Finance

Scope and subject matter-sources of public revenue (tax revenue and non tax revenue) –public expenditure -public debt- methods of debt redemption- Budget-types of budget (33 hrs).

Module IV: Development issues of Indian economy

Poverty, Inequality, Unemployment and Black money- Demonetization –Features of Kerala economy-Kerala model of development- decentralized planning in Kerala-Demographic profile of Kerala with latest census report (32 hrs)

Books for Study

1. Dewett KK (2002): Advanced Economic Theory, S.Chand
2. Mankiw, Gregory N(2007) 'Macroeconomics' – Worth Publishers
3. Uma Kapila(2012)Indian Economy Since Independence, Academic Foundation
4. Prakash, BA(2004) Kerala's Economic Development Emerging Issues and Challenges, Sage
5. Mithani, D.M(2010): Modern Public Finance: Theory and Practice , Himalaya Publishing House

Books for Reference

1. Lekhi, R.K(2010) Public Finance, Kalyani Publishers
2. Hajela, T.N(2012) Public Finance , ANE Books
3. Gupta, DP and Gupta, R K – Modern Banking in India, Asian Books Private Ltd.

COMPLEMENTARY ELECTIVE COURSE 07:
HISTORY OF ECONOMIC THOUGHT- I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1II	3C 07 ECO	6	4	3

COURSE OUTCOMES

1. Students are expected to get an idea of the economic philosophy in a historical perspective
2. Students are also exposed to heterogeneous thinking in economics

Module I: Introduction and Pre Classical Economic Thought

Scope and significance of Economic Thought – Ancient Economic thought: Economic ideas of Aristotle and Plateau – Doctrines of Just Cost and Just Price – Medieval Economic Thought: Francois Quesnay - Abu Yusuf and Ibn Khaldun – Economic Ideas of Mercantilism: St.Thomas Acquinas, Thomas Mun – Physiocracy: Natural Order, Tableau Economique **(30 hours)**

Module II: Classical Economic Thought

Classicism: Features – Ideas of (i) Adam Smith: concept of Laissez faire, invisible hand, division of labour, naturalism and optimism, theory of value, canons of taxation- critiques of Adam Smith's thought –(ii) David Ricardo: theory of rent, theory of distribution, ideas of economic development and foreign trade, stationary state, criticism (iii) J.B Say: Says Law of Market and its implications (iv) T.R. Malthus: theory of population and theory of glut, criticism – (v) J.S. Mill : Reciprocal demand (vi) Jeremy Bentham: Utilitarianism **(36 hours)**

Module III: Socialist Economic thought

Early socialists: Contributions of St.Simon and Sismondi – Utopian Socialism: Ideas of Robert Owen, Charles Fourier, Proudhon and Louis Blanc – State Socialists: Robertus and Lasalle

(24 hours)

Module IV: Basic Tenets of Marxian Political Economy

Marx's Method : Dialectical Materialism – Mode of Production –Capitalist Production – Labour theory of Value - Surplus Value – Organic Composition of Capital – Declining Rate of Profit - Accumulation of Capital – Industrial Reserve Army – Immiserization of the Proletariat – Concentration and Centralization of Capital – Capitalism and Crisis – Relevance of Marxian Economics in the Contemporary Capitalist World - Lenin's Theory of Imperialism – Democratic Socialism **(18 hours)**

Books for Study:

1. Robert B Ekelund, Jr. and Robert F. Hebert (2007) A History of Economic Theory and Method, Waveland Press.

2. Ernesto Screpanti and Stefano Zamagni (2005) An Outline of the History of Economic Thought, OUP.
3. Phyllis Deane (2012) The Evolution of Economic Ideas, Cambridge University Press
4. Haney,Lewis (1949)History of Economic Thought, Macmillan
5. Eric Roll (1961)A History of Economic Thought, Prentice-Hall, New York
6. Landreth, Harry and Colander, David (2002). History of Economic Thought. Hougthon Mifflin

Books for Reference:

1. Sandelin, Bo, Trautwein, Hans, Wundark, Richard (2008). A Short History of Economic Thought. Routledge.
2. Hollis, Martin (2008). The Philosophy of Social Science: an introduction. Revised and Updated. Cambridge University Press.
3. Barber,William(2009) A History of Economic Thought, Wesleyan University Press
4. Lekachman Robert (1989)A History of Economic Ideas, McGraw Hill
5. Ganguli B.N , Indian Economic Thought: A Nineteenth Century Perspective
6. Gagan Jain, Nobel Prize winners in Economics, Publisher: Three Essays Collective
7. Ghosh and Ghosh (2015), Concise History of Economic Thought, Himalaya Publishing House, New Delhi

COMPLEMENTARY ELECTIVE COURSE 08:
HISTORY OF ECONOMIC THOUGHT- II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1V	4C 08 ECO	6	4	3

COURSE OUTCOMES

1. Students are expected to get an idea of the economic philosophy in a historical perspective
2. Students are also exposed to some of the heterogeneous thinking in economics like Neoclassical, Keynesian and Indian economic thinking

Module I: Marginalism and Neo Classical School

The marginal revolution : Ideas of Herman Heinrich, Gossen, William Stanely Jevons, Leon Walras and Carl Menger, Frederich List, Wieser, Bohm-Bawerk, Wicksell ,Wicksteed, Veblen, Institutionalism, Wilfredo Pareto, Alfred Marshall, A.C Pigou and Irving Fisher –Difference between Classical and Neo-classical approach (38 hours)

Module II Keynes and Post Keynesians

Keynes as a critique of Classical Economics – Keynesian theory of Employment: Effective Demand, Underemployment equilibrium– Concept of Multiplier – Post Keynesian Developments: Monetarism and New Classical School: Rational Expectation (30 hours)

Module III Indian Economic Thought

Ancient Indian Economic Thought: Kautilya and Thiruvalluvar. Modern Indian Economic Thought: Dada Bai Naoroji, M G Ranade, R.C. Dutt, J K Mehta, Economic Ideas of M K Gandhi, Dr. B.R. Ambedkar, M.S. Swami Nathan, Amartya Sen (30 hours)

Module IV Nobel Laureates in Economics

History of Nobel Prize – Nobel laureates in economics: Contributions of Gunnar Myrdal, Arthur Lewis, Elinor Ostrom, Thaler, Amartya Sen and Nordhaus (Current Nobel laureate in economics) [10 hours]

Books for Study:

1. Haney,Lewis (1949)History of Economic Thought, Macmillan
2. Eric Roll (1961) A History of Economic Thought, Prentice-Hall, New York
3. Robert B Ekelund, Jr. and Robert F. Hebert (2007) A History of Economic Theory and Method, Waveland Press.
4. Ernesto Screpanti and Stefano Zamagni (2005) An Outline of the History of Economic Thought, OUP.
5. Phyllis Deane (2003) The Evolution of Economic Ideas, Cambridge University Press

6. Landreth, Harry and Colander, David (2002). History of Economic Thought. Hougthon Mifflin

Books for Reference:

1. Sandelin, Bo; Trautwein, Hans; Wundark, Richard (2008). A Short History of Economic Thought. 2nd Edition. Routledge.
2. Hollis, Martin (2008). The Philosophy of Social Science: an introduction. Revised and Updated. Cambridge University Press.
3. Barber,William(2009) A History of Economic Thought, Wesleyan University Press
4. Lekachman Robert (1989) A History of Economic Ideas, McGraw Hill
5. Ganguli B.N, Indian Economic Thought: A Nineteenth Century Perspective
6. Gagan Jain DLit, Nobel Prize winners in Economics, Publisher: Three Essays Collective
7. Ghosh and Ghosh (2015) Concise History of Economic Thought, Himalaya Publishing House, New Delhi

COMPLEMENTARY ELECTIVE COURSE 09:
POPULATION AND DEVELOPEMNT

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1	1C 09 ECO	6	4	3

COURSE OUTCOME

1. Students will be able to identify the linkage between population and development
2. Students will be able to get an idea of the basic demographic concepts like fertility, mortality, migration and urbanization
3. Students are also expected to get an understanding on the regional, national and global population trends

Module I: Introduction

Meaning, Nature, Scope and Importance of Population Studies- Difference between Demography and Population Studies- Subject matter of Population Studies; Structure, Size, Characteristics and Distribution of population- Components of population change viz fertility, mortality and migration- Sources of Population Data; Census, Sample Surveys, Registration of Vital Events and NPR- Population and Economic Development- Inter relationship between Population and Development- Theories of population: Theory of Demographic Transition, Malthusian theory of population and Optimum theory of Population (35 hours)

Module II: Measures of Fertility and Mortality

Measures of Fertility: Crude Birth Rate, General Fertility Rate, Age Specific Fertility Rate, Total Fertility Rate, Gross Reproduction Rate and Net Reproduction Rate.

Measures of Mortality: Crude Death Rate, Age Specific Mortality Rate, and Infant Mortality Rate- Life Expectancy- Neo Natal Death Rate and Post Neo Natal Death Rate (18 hours)

Module III: Migration and Urbanization

Migration- meaning, types, determinant and consequences- Causes of Migration- Theories of Migration- Evert Lee’s theory of Migration and Ravenstein’s Laws of Miggration. Urbanisation- Meaning, Definition, Causes and consequences of Urbanisation (30 hours)

Module IV: Trends in Population Growth

Population growth trends in Kerala, India and the world- Age composition of India and Kerala- Ageing- National Population Policy- Family Welfare Programmes- Age Pyramids- - Population Dividend- Zero Population Growth- Population Projection- Stable, Stationary and Quai-stationary Population (25 hours)

Books for Study

1. Asha.A Bhande & Tara Kanikkare (2000) Principles of Population Studies, Himalaya Publishing House.
2. Misra, B. D. (1982). *An Introduction to the Study of Population*. South Asian Publishers.
3. Bougue, D.J (1971) Principles of Demography, Wiley

Books for Reference

1. Peter.R. Cox (1981), Demography, Universal Book Stall, New Delhi.
2. Demeny and Geoferry Menicoll (1998) Population and Development, Earth Scan Publications.
3. Agarwal,S.N(2000) India's Population Problem, Tata Mc Grew Hills
4. Sreenivasan,K and K.B. Pathak, Dynamic of Population and Family Welfare, Himalaya Publishing House, New Delhi.
5. Prasad.P.K, (2010) Population Planning; Policy and Programmes, Deep and Deep Publishers, New Delhi.
6. Zakaria, KC and S.Irudyarajan (2004) Kerala's Demographic Transition: Determinants and Consequences, Sage, New Delhi.
7. Govt of India: Census 2011

COMPLEMENTARY ELECTIVE COURSE 10:
ECONOMIC GEOGRAPHY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2C10 ECO	6	4	3

COURSE OUTCOME

1. Students will be exposed to the emerging branch of economic geography.
2. The course will provide preliminary inputs for sharpening their analytical tools of economic geography.
3. Students will also get an idea of geography of key economic variables in the Indian context

Module 1:

Economic Geography – Philosophy, Nature, Scope and Significance – Economic Geography and Inter-disciplinarily – Key Concepts in Economic Geography – Cluster, Core, Periphery, Agglomeration, Space, Place and Scale - World Economic Geography: Geography of Global Income Disparity **(20 Hours)**

Module 2:

Theoretical Approaches in Economic Geography – Neo-classical Spatial Equilibrium: Centre Place Theory & Cumulative Causation – Marxist Inspired Approaches to Uneven Development: Spatial Division of Labour Theory – Immanuel's Core–Periphery Theory – New Economic Geography – Krugman's Centre–Periphery Model. **(35 Hours)**

Module 3:

Geography of Growth and Development in India: Regional Disparities in Income, Human Development, Poverty and Unemployment, Geography of Sectoral Growth in India: Agriculture, Industry and Services **(25 Hours)**

Module 4:

Factors Responsible for Regional Imbalances India - Economic Policies for Addressing Regional Imbalances in India: Planning for Regional Development: Fine Year Plans and Decentralised Planning **(28 Hours)**

Books / Reports for Study

1. M. Sokol, (2011), "Economic Geography" International programmes, University of London - London School of Economics
2. Saxena (2014) Economic Geography, Rawat Publications
3. Krugman (1991) Geography and Trade, Cambridge IT press.

Books / Reports for Reference

1. Scott, A. J. (2017). A Perspective of Economic Geography. In *Economy* (pp. 3-23). Routledge.

2. Krugman, P. (1991). Increasing Returns and Economic Geography. *Journal of Political Economy*, *99*(3), 483-499.
3. Kurian, N. J. (2000). Widening Regional Disparities in India. *EPW*, *35*(7), 538-550.UNCRD (2012), Regional Planning and Development
4. Nayyar, G. (2008). Economic Growth and Regional Inequality in India. *EPW*, 58-67.

COMPLEMENTARY ELECTIVE COURSE 11
AGRICULTURAL ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	3C11 ECO	6	4	3

COURSE OUTCOME

1. The course is expected to provide a basic knowledge of the essentials of agricultural economics
2. Students are expected to get an opening for higher studies and research in agricultural economics
3. The course will help students to get an agrarian entrepreneurship towards a source of livelihood.

Module I: agricultural Economics – nature and scope – role and importance of Agriculture Economic development – inter-linkages between agricultural and non-agricultural sectors (15 hours)

Module II: Agrarian relations – land reforms with special focus on India and Kerala – technology in Agriculture – Green revolution – sustainable agriculture – emerging trends in agricultural technology - Biotechnology (25 hours)

Module III Agricultural production and productivity – Production relationships – types of farming – subsidies – input subsidies and Indian Agriculture – Crop Insurance – Agricultural Finance – Agricultural Marketing – structure and problems of Agricultural finance and marketing in India– WTO and Indian Agriculture– Challenges and prospects- (35 hours)

Module IV: Agricultural performance of India and Kerala– Five year plans and Indian agriculture – crop diversification – organic farming – farm management – Agricultural extension – food security – New Economic Policy and agriculture – Agricultural policy – Major issues of Kerala agriculture.(30 hours)

Books for Study:

1. Amarjit Singh,A N Sadhu, Jasbir Singh (2002),' Fundamentals of Agricultural Economics '– Himalaya Publishing House
2. SAR Bilgrami(2018) 'An Introduction to Agricultural Economics' - Himalaya Publishing House, Mumbai
3. Dutt and Sundaram (2009) 'Dutt and Sundaram's Indian Economy', S Chand and Co.
4. Govt of Kerala(2018) Economic Review, Kerala State Planning Board, Thiruvananthapuram

Books for Reference

1. Joginder Singh and Lekhi , R.K (2017)'Agricultural Economics: An Indian Perspective' – Kalyani Publishers, Bengaluru
2. Subba Reddy, S et.al (2008) Agricultural Economics, OUP

COMPLEMENTARY ELECTIVE COURSE 12: GENDER ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
1V	4C 12 ECO	6	4	3

COURSE OUTCOMES

1. Students will be having an understanding of the basic concepts relating to gender as a social construct and its link with development.
2. Students are exposed to gender challenges to development

MODULE 1: Introduction to Gender Economics

Meaning and importance of gender economics – Definition of gender: LGBTQ– Distinction between gender and sex- gender equity and gender equality– Patriarchal and Matriarchal families – Approaches of gender development: WID, WAD and GAD - Gender inequality indices - GDI, GII, GEM (18 hours)

MODULE II : Gender Status in India

Demography of female population in India : Sex ratio, Mortality, Morbidity and life expectancy – Gender inequalities in education - Health and nutrition – feminization of poverty – Concept of missing women – National Rural Health Mission – Equity in health delivery system. (20 hours)

MODULE III: Women and Labour Market

Discrimination in the labor market – Wage disparity- paid & unpaid work- Productive & unproductive work – Visible and invisible work –Female work participation rate – LFPR and Gender discrimination - Occupational segregation - Triple role of women- Housewifisation – Feminization and gender inequality (32 hours)

MODULE IV: Women Empowerment

Concept of women empowerment – Political participation & decision making: Ratio of Women law makers in the Centre, State and Local bodies - Education and Socio Economic empowerment – Issues related to women's education –Access, Enrolment, Dropouts - Women empowerment programmes in India with special reference to Kudumbasree in Kerala – Role of Government, NGOs and Self Help Groups in Women Empowerment. (38 hours)

Books for Study

1. Boserup, E. (1970). Women's Role in Economic Development George Allen and Urwin.
2. Desai,N. and M.K.Raj(1974),Women and Society in India, Research Centre for Women Studies, SNDT University, Bombay
3. Seth .M. (2000), Women and Development: The Indian Experience, Sage.
4. Pal, M., Bharati, P., Ghosh, B., & Vasulu, T. S. (2012). *Gender and Discrimination: Health, Nutritional Status, and Role of Women in India*. OUP.

5. Venkateswaran, S. (1995). *Environment, Development and the Gender Gap*. Sage.

Books for Reference

1. National Commission for Women, Towards Equality- The Unfinished Agenda- Status of Women in India -2001, New Delhi, (2002)
2. Peterson J and M Lewis (ed.2001), The Elgar Companion to Feminist Economics
3. Agarwal ,Bina ,(1994)A Field of One's Own: Gender and Land Rights in South Asia, Cambridge University Press, New Delhi
4. Government of India (1974) Towards Equality-Report of the Committee on the Status of Women in India, Department of Social Welfare, Ministry of Education and Social Welfare, New Delhi.
5. Krishnaraj.M, R. M Sudarshan and A.Shariff (1999) Gender, Population and Development, OUP, New Delhi
6. Srinivasan, K and A.Shroff (1998), India: towards population and Development Goals, OUP, New Delhi
7. Wazir, R, (2000) The Gender Gap in Basic Education: NGOs as Change Agents, Sage.
8. Govt.of India (2009) Gender Equality and Women's Empowerment in India, National Family Health Survey 2005-06, Ministry of Family Welfare, New Delhi.
9. Das, Kumar, (2009) Gender Dynamics in Economic Development of India, Reference Press, New Delhi
10. Sen, Sujata (2012), Gender Studies, Dorling Kindersley (India) Pvt.Ltd & Pearson
11. Sen, Suvarna (2006), Gender and Development, ICFAI University Press, Hyderabad.

PART C:

ECONOMICS/DEVELOPMENT ECONOMICS: GENERIC ELECTIVE COURSES WORK AND CREDIT DISTRIBUTION (2019 ADMISSION ONWARDS)

EACH DEPARTMENT SHALL OFFER A POOL OF FIVE GENERIC ELECTIVE COURSE **AT A TIME, TRANSACTION THROUGH GUIDANCE MODE**. STUDENTS OF OTHER DEPARTMENTS CAN CHOOSE **ANY ONE OF THE GENERIC ELECTIVE COURSE FROM THE POOL OF FIVE COURSES.** ALL DEPARTMENTS (WHETHER IT IS A CORE DEPARTMENT OR COMPLEMENTARY DEPARTMENT CAN OFFER THE COURSE IN SEMESTER V)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS/ WEEK	CREDIT	EXAM HOURS	MARKS EXT+INT
5 D 01 ECO/ DEV ECO	BASICS OF ECONOMICS	**V**	2	2	2	20+5
5 D 02 ECO/ DEV ECO	DEVELOPMENT ISSUES OF INDIAN ECONOMY	**V**	2	2	2	20+5
5 D 03 ECO/ DEV ECO	KERALA ECONOMY	**V**	2	2	2	20+5
5 D 04 ECO/ DEV ECO	FUNDAMENTALS OF BUDGET	**V**	2	2	2	20+5
5D 05 ECO/ DEV ECO	INDIAN ECONOMY IN THE POST-REFORM PERIOD	**V**	2	2	2	20+5

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

INTERNAL ASSESSMENT

COMPONENT *	WEIGHTAGE**	REMARKS
COMPONENT 1 EXAM. ----------------------	50%	
COMPONENT 2 ASSIGNMENT VIVA/SEMINAR	50%	

*Any two components, Attendance shall not be a component

GENERIC ELECTIVE COURSE 01:
BASICS OF ECONOMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D 01ECO/ DEV ECO	2	2	2

COURSE OUTCOMES:

1. Students will have an understanding of the basic concepts of economics in everyday life
2. Students will be able to get an idea of major economic issues

Module I: Introduction to Economics

Definition of Economics – Nature and scope of economics – Problems of scarcity and choice: The three key economic questions – Opportunity Cost - Micro and Macro economics –Elementary theory of demand: determinants of household demand, market demand, movement along and shift of the demand curve – Elementary theory of supply: determinants of supply, movement along and shift of supply curve – Market equilibrium

Module II Market and Economy

Forms of Market: Features of Perfect competition, Monopoly, Monopolistic Competition and Oligopoly – Characteristics of a good economy - Types of Economy: Features of Capitalist, Socialist and Mixed Economy- Growth and Development- Issues in Economic Development: Causes of Poverty, Unemployment and Inequality – Basic concepts of National income: GNP, GDP, NNP and PI – Functions of Money – Basic concepts: CRR and SLR, Repo rate, Surplus and Deficit Budget

Books for Study

1. Dominick Salvatore(2004) Microeconomics : Theory and Applications, OUP, New Delhi
2. Pindyck Robert and Rubinfeld Daniel (2014) Micro Economics 8th Edition Pearson.
3. Dwivedi,D N(2011) Macro Economics Theory and Policy 5th Edition , McGraw Hill.
4. Fernando, A.C(2010) Indian Economy , Pearson India Education Services Pvt.Ltd
5. Gaurav Datt and Ashwani Mahajan(2016) , Indian Economy, S.Chand New Delhi

Books for Reference

1. Mankiw, Gregory N (2009) Principles of Macroeconomics'–Cengage Learning India Pvt. Ltd.
2. Errol D'Souza (2008) Macro Economics – Pearson Education.
3. Ashok Thomas et.al.(2018) Macro Economics, McGraw Hill Education (India) Edition

GENERIC ELECTIVE COURSE 02:
DEVELOPEMNT ISSUES OF INDIAN ECONOMY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D 02ECO/ DEV ECO	2	2	2

COURSE OUTCOME

1. Students will be able to develop a comprehensive perspective on the development issues confronted by Indian economy.
2. Students will be able to apply economic theories and concepts for understanding contemporary development issues.

Module 1 Poverty in India:

Poverty; meaning, absolute poverty and relative poverty, causes of poverty, poverty line, head count index, basic needs approach, capability approach. Extent, magnitude and inter-state comparison of poverty, poverty eradication measures in India since 1991.

Module 2 Unemployment and Inequality in India:

Unemployment; meaning, causes of unemployment, types of unemployment, NSSO classification of unemployment, extent and magnitude of unemployment, labour force participation rate, informalisation of labour, Inequality; meaning, causes of inequality, extent of inequality, inclusive growth.

Books for Study

1 Misra, S.K and V K Puri(2018): Indian Economy, Himalaya Publishing House.

2 Datt, Gaurav and Ashwani Mahajan(2016) Indian Economy, S. Chand and Sons.

3 Kapila, U. (Ed.). (2009). *Indian Economy since independence*. Academic Foundation.

4 Datt, Ruddar and K P M Sundaram(2017)Indian Economy, S. Chand and Sons.

5 Dhingra, I. C. (2013). *The Indian Economy: Environment and Policy*. Sultan Chand & Sons.

6 Agrawal, A. N. (2012). Indian Economy: Problems of Development and Planning.

7 Remesh Singh(2019) Indian Economy, McGraw Hill Private Ltd.

Books for Reference

1 Jalan, B. (2012). *Emerging India: Economics, Politics, and Reforms*. Penguin Books India.

2 Uma Kapila(2013)Two Decades of Economic Reforms in India: Towards Faster Sustainable and More Inclusive Growth, 3rd edition, Academic Foundation, New Delhi.

3 Kaushik Basu (2004) India's Emerging Economy: Performance and Prospects in the 1990s and Beyond, MITP Press.

4 Sen, A. (1982). *Poverty and Famines: An Essay on Entitlement and Deprivation*. OUP.

GENERIC ELECTIVE COURSE 03:
KERALA ECONOMY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D 03ECO/ DEV ECO	2	2	2

COURSE OUTCOMES

1. Students will be able to understand the structural changes in Kerala Economy.
2. The course will provide the students a basic understanding about the developmental issues of Kerala Economy.

Module-I Kerala in the National Economy

Significant features of Kerala economy since state formation-Kerala as a developmental model: debates on the existence and sustainability of Kerala model. Sectoral composition of Kerala economy-developmental challenges faced by agriculture, industry and service sector, significance and growth of service sector: health, education, and banking, tourism, IT, transport - liberalization policies and its impact on service sector.

Module II Developmental Issues in Kerala

Demographic transition-aging population–Migration-inward and outward migration-Poverty-Unemployment-environmental issues, food security, energy crisis- Decentralized governance and its impact on Kerala economy- Fiscal crisis of Kerala.

Books/Report for Study

1. Government of Kerala (2019) Economic Review, Kerala State Planning Board, Thiruvananthapuram
2. Prakash, B. A. (1999). *Kerala's Economic Development: Issues and Problems*. Sage.

Books for Reference

1. George, K. K. (1999). *Limits to Kerala Model of Development: An Analysis of Fiscal Crisis and its Implications*. Centre for Development Studies.
2. Tharamangalam, J. (Ed.). (2006). *Kerala: The Paradoxes of Public Action and Development*. Orient Longman.
3. Harilal, K. N., & Joseph, K. J. (2003). Stagnation and Revival of Kerala economy: An Open Economy Perspective. *EPW*, 2286-2294.
4. Oommen M A (Ed. 1999), Rethinking Development: Kerala’s Experience, vol.1 & II, New Delhi: Institute of social sciences.

GENERIC ELECTIVE COURSE 04:

FUNDAMENTALS OF BUDGET

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5D 04 ECO/ DEV ECO	2	2	2

COURSE OUTCOME

1. Students will get an idea about budget and the basic concepts, apart from budgetary procedures
2. Students will acquire basic knowledge about the sources of revenue and expenditure of govt.

Module I. Budget

Meaning and objectives of budget- Principles of budgeting - Budgetary procedure (preparation of the budget, presentation of the budget in the parliament, execution of the budget and parliamentary control over the budget)- Balanced ,surplus and deficit budgets- Performance budget and Zero Based Budget- Consolidated fund and contingency fund- - Major deficit concepts (Revenue deficit, fiscal deficit, primary deficit)- Major highlights of the current year's Budget.

Module II. Public expenditure and revenue

Public expenditure – Meaning- classification (Revenue and capital expenditure, plan and non-plan expenditure), reasons for the growth of public expenditure in India.

Public revenue - Sources (Tax revenue and non-tax revenue)- Tax (meaning and features)- Direct and indirect taxes- progressive, proportional, regressive and digressive taxes- Tax evasion and tax avoidance – Finance commission and functions.

Books for Study

1. Jha, R. (1998), Modern Public Economics, Routledge, London
2. Mithani, D.M: Modern Public Finance: Theory and Practice
3. Musgrave, R.A. and P.B. Musgrave(1976) Public Finance in Theory and Practice, McGraw Hill
4. Rana, K.C & Varma, K.N: A Study in Public Finance.

Books for Reference

1. Hajela, T.N (2010): Public Finance, Ane Books
2. Herber, B.P. (1967) Modern Public Finance, Richard D. Irwin, Homewood.
3. Andley,K.K and K. P. M. Sundharam(1966) Public Finance and Public Economics: With Special Reference to Underdeveloped Countries, Ratan Prakashan Mandir,
4. Singh S K (2010): Public Finance: Theory and Practice, S Chand.

GENERIC ELECTIVE COURSE 05:
INDIAN ECONOMY IN THE POST REFORM PERIOD

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	**5D 05ECO/ DEV ECO**	**2**	**2**	**2**

COURSE OUTCOMES

1. Students will be aware of the structural changes in the Indian economy during the post reform period.
2. Students will be equipped to evaluate the impact of the New Economic Policies on the various sectors of the economy.

Module1: Introduction to Economic Reforms in India

The background of economic reforms –The macroeconomic crisis in the beginning of 1990's, Rationale for the economic reforms, Concepts of neoliberalism, globalization, liberalization and privatization etc

Module 11: Review of Economic Reforms in India in the Last 25 years

Performance of Indian economy: An evaluation based on GDP growth. Sectoral (Agricuture, industry and service) wise growth and share of each sector.–Agriculture sector reforms -New agricultural policy: Objectives and strategies; features WTO agreement. Impact of reforms on agriculture sector. Industry-New industrial policy: Objectives and strategies , Service Sector growth after reforms, Volume ,Composition and direction of trade in the reform period –Concepts of FDI and FPI .Impact of neo economic policies on status of poverty ,unemployment and inequality. Jobless growth and casualisation of labour. Inclusive growth policies: features and strategies.

Books for Study

1. Uma Kapila (2017) "Indian Economy: Performances and Policies" Academic Foundation, New Delhi.
2. Ruddar Dutt & KPM Sundaram (2013): Indian Economy; S.Chand & Co Ltd, New Delhi
3. Puri, V. K., & Misra, S. K. (2014). *Indian Economy-its Development Experience*. Himalaya Publishing House.

Books for Reference

1. Dhar, P. K. (2000). *Indian Economy: Its Growing Dimensions*. Kalyani Publishers.
2. Kapila, U. (Ed.). (2009). *India's Economic Development Since 1947*. Academic Foundation.

CORE COURSE: MODEL QUESTION PAPER
KANNUR UNIVERSITY
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
MICRO ECONOMIC ANALYSIS-I (Core Course)
SEMESTER I

Time: 3 Hours **Maximum Marks: 40**

Part A
(Answer All Questions. Each Carries One Mark)

1. What is economic theory?
2. State elasticity of Demand.
3. Define consumer surplus.
4. What is meant by substitution effect?
5. Define production function
6. Define market equilibrium

1x6=6

Part B
(Answer Any Six Questions. Each Carries Two Marks)

7. Distinguish between micro and macro economics.
8. What is expansion path?
9. What is water diamond paradox?
10. Explain linearly homogenous production function.
11. Briefly explain revealed preference theory of Samuelson.
12. Briefly explain the elasticity of supply.
13. State and explain the law of diminishing marginal utility.
14. Explain the Price Ceilings and Price Floors.

6x2=12

Part C
(Answer Any Four Questions. Each Carries Three Marks)

15. Distinguish between cardinal and ordinal utility approaches to consumer behavior.
16. Critically examine the Law of equi marginal utility.
17. Briefly explain the scope and subject matter of micro economics.
18. What is an indifference curve? Explain the properties of indifference curve.
19. Explain the Hicksian version of splitting up of price effect into income effect and substitution effect.
20. Explain producer equilibrium with the help of isoquant isocost analysis.

4x3=12

Part D
(Answer Any Two Questions. Each Carries Five Marks)

21. Explain consumer equilibrium with the help of ordinal analysis.
22. Explain the short run and long run cost curves in traditional and alternative approaches.
23. Explain elasticity of demand. Illustrate different types and methods of measurement of price elasticity of demand.
24. Explain economies and diseconomies of scale.

5x2=10

KANNUR UNIVERSITY
MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
MICRO ECONOMIC ANALYSIS-II (Core Course)
SEMESTER 1I

Time: 3 Hours **Maximum Marks: 40**

Part A
(Answer All Questions. Each Carries One Mark)

1. Define price discrimination.
2. What is selling cost?
3. What is functional distribution?
4. Define quasi rent.
5. Distinguish between MRP and VMP
6. What is excess capacity? 1x6=6

Part B
(Answer Any Six Questions. Each Carries Two Marks)

7. Explain the types of monopoly.
8. Explain the features of perfect competition.
9. What is shut down point?
10. Explain subsistence theory of wages.
11. Distinguish between collusive and non collusive oligopoly.
12. Explain monopsony market.
13. Explain the degrees of price discrimination.
14. Explain price leadership 2x6=12

Part C
(Answer Any Four Questions. Each Carries Three Marks)

15. Explain the indeterminacy of price and output under bilateral monopoly.
16. Explain the product exhaustion theorem.
17. Explain briefly the Bertrand Model of duopoly.
18. Explain the necessary conditions and features of oligopoly.
19. Explain Keynesian theory of interest.
20. Examine group equilibrium under monopolistic competition? 3x4=12

Part D
(Answer Any Two Questions. Each Carries Five Marks)

21. Define monopoly. Explain price and output determination under short run and long run.
22. Explain marginal productivity theory of distribution
23. Briefly explain the Ricardian theory of rent
24. Explain price rigidity under oligopoly 5x2=10

CORE COURSE: MODEL QUESTION PAPER
B.A DEGREE EXAMINATION ECONOMICS
CENTRAL THEMES IN INDIAN ECONOMY
(SEMESTER III)

Time: 3 Hours Maximum Marks: 40

Part A

(Very short answer type questions) Answer all Questions

1. Work Participation Rate
2. NITI Ayog
3. Decentralized Planning
4. Concept of Poverty
5. Disguised unemployment
6. Demonetization

(6 x 1= 6)

Part B

(Short answer type questions) Answer Any **SIX** Questions

7. Examine the causes of low productivity in Indian agriculture
8. Write a note on Agreement on Agriculture
9. What you mean by Ever Green Revolution
10. Examine the fiscal crisis in Kerala
11. Examine the role of Cottage and Small Scale industries in the growth of Indian economy
12. Explain the nature of Cropping Pattern in Kerala
13. State the New Economy Policy of 1991.
14. What is demographic Transition? Explain its different stages. (6 x 2 = 12)

Part C

(Short Essay type questions) Answer Any **FOUR** Questions

15. Highlight Kerala's development in Social Sector.
16. Explain the importance of agriculture in Indian economy
17. Briefly explain the reasons of income inequalities in India
18. Examine the features of Kerala economy
19. Explain the role of small scale industries in India
20. Write a note on health sector in Kerala

(4 x 3 = 12)

Part D

(Essay type questions) Answer Any **TWO** Questions

21. Explain the pattern of Industrial development since Independence
22. Briefly explain the impact of WTO on Indian agriculture
23. Evaluate the Poverty Eradication Programmes after 1991.
24. Examine the Unemployment problem in Kerala (5X2=10)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION –DEVELOPMENT ECONOMICS (CORE COURSE)
3 B03 DEVECO: THEORIES OF ECONOMIC DEVELOPMENT
SEMESTER III

Time: 3 hours **Max.Marks: 40**

Part – A
(Very short answer type Questions. Answer all Questions)

1. Define HDI
2. Define Human Capital formation
3. What is surplus value?
4. Explain stationary state
5. Define the term innovation
6. Explain the concept of take off **(6x1=6marks)**

Part – B
(Short answer type Questions- Answer any Six Questions)

7. What is intermediate technology?
8. Explain the theory of demographic transition
9. Distinguish between backward linkages and forward linkages
10. What are the determinants of development?
11. What is the significance of gender development index?
12. Explain the core values of development
13. Differentiate between Women in Development (WID) and Women and Development (WAD)

14 What is organic composition of capital?

(6x2=12Marks)

Part – C
(Short Essay type Questions-Answer any Four Questions)

15. Explain Rostow's stages of growth
16. Explain Human Development Index. Compare recent trends in HDI in India and Kerala.
17. Explain the Unbalanced growth theory.
18. Explain Schumpeter's theory of economic development.
19. Discuss Leibenstein's Critical Minimum Effort Thesis
20. Explain advantages and disadvantages of inward looking and outward looking policies.

(4x3=12 Marks)

Part – D
(Essay type Questions) Answer any Two Questions

21. Critically Examine Lewis labour surplus theory of development
22. Explain the structure and characteristics of a developing economy

23) Critically evaluate Marxian theory of development?
24) Explain the relevance of Harrod Domar theory?

(2x5=10 Marks)

CORE COURSE: MODEL QUESTION PAPER
B.A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
INTERNATIONAL ECONOMICS
(SEMESTER III)

Time: 3 Hours **Maximum: 40 marks**

Part – A (Very short answer type Questions). Answer all Questions.

1. What do you mean by BOP?
2. Define net barter terms of trade
3. Differentiate between international trade and inter-regional trade
4. What do you mean by free trade
5. Define Voluntary export restraints
6. Define export subsidies (1x6=6)

Part – B (Short answer type Questions) Answer any SIX Questions

7. What is reciprocal demand
8. What do you mean by non-tariff barriers
9. Define dumping
10. Write a short note on balance of trade
11. Critically illustrate the impact of foreign direct investment in India since globalization
12. Define terms of trade
13. Differentiate between current and capital account
14. What do you mean by optimum tariff

(2x6=12)

Part – C (Short Essay type Questions) Answer any FOUR Questions

15. Critically evaluate the purchasing power parity theory
16. Explain the comparative cost theory
17 Give a brief account of foreign portfolio investment
18 Examine the impact of tariffs
19. Discuss the role of IMF in correcting BOP disequilibrium in member countries
20. Explain the opportunity cost theory. (3x4=12)

Part-D (Essay type Questions) Answer any TWO Questions

21. Critically evaluate the Heckscher- Ohlin trade theory
22 Discuss the role of WTO and other free trade agreements in promoting the foreign trade of India
23. What do you meant by balance of payment disequilibrium .Give a brief account of the important causes of the BOP disequilibrium and the measures to correct the disequilibrium?
24. Describe the different types of non-tariff barriers and its impact on the trade.

(5x2=10),

MODEL QUESTION PAPER
IV SEMESTER BA DEGREE EXAMINATION
CORE COURSE IN ECONOMICS/DEVELOPMENT ECONOMICS
RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS

Time: 2 Hours **Max. Marks: 30marks**

Part A (Answer **All** Questions)

1. What is hypothesis?
2. What are footnotes?
3. What is research? **(1X3=3)**

Part B (Answer **Any 5** Questions)

4. Distinguish between bibliography and reference.
5. Distinguish between inductive and deductive method.
6. What are the criteria of good research?
7. Distinguish between questionnaire and schedule.
8. What are the major modes of referencing in research?
9. What are the functions of literature review?
10. Distinguish between census and sampling method. **(2x5=10)**

Part C (Answer **Any 4** Questions)

11. Briefly explain the structure of research report.
12. What are the problems of research in social science?
13. Explain the structure of research report.
14. Explain the various steps involved in research process.
15. What are the ethical practices in social science research?
16. Briefly explain the steps involved in research process.

(3X4=12)

Part D (Answer **Any One** Question)

17. Explain the various types of research methods.
18. What is plagiarism? Explain the various forms and consequences of plagiarism.

(5X1=5)

KANNUR UNIVERSITY
IV Semester B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
ENVIRONMENTAL ECONOMICS

Time: 3 Hours **Max. Marks: 40**

Part - A

(Answer all questions. Each question carries 1 mark)

1. Environmental economics.
2. Disaster management
3 E-waste
4. Externality
5. Vulnerability
6. Soil erosion

(1x6=6)

Part - B

(Answer any 6 questions. Each question carries 2 marks.)

7. How is a biocentrism different from anthropocentrism?
8. Explain the relationship between environment and economy
9. Differentiate between weak sustainability and strong sustainability
10. What is the significance of 'tragedy of Commons' in environmental economics?
11. Explain free rider problem
12. Distinguish between renewable and non-renewable resources.
13. Explain the important pollution control instruments.
14. What is resource taxonomy?

(2x6=12)

Part - C

(Answer any 4 questions. Each question carries 3 marks.)

15. Explain the material balance model.
16. What are the causes and effects of global warming?
17. Explain the need for conservation of natural resources
18. Explain Coase theorem
19. What are the causes for market failure in environmental economics?
20. Explain the nature and scope of environmental economics.

(3x4=12)

Part - D

(Answer any 2 questions. Each question carries 5 marks.)

21 Explain briefly the major environmental problems in Kerala.
22. Define Sustainable development. What are the indicators and obstacles of sustainable development.
23. What are the different types of disasters? Explain the importance and relevance of disaster management in the present environmental scenario.
24. Explain the market failure in the presence of externalities. (5x2=10)

MODEL QUESTION PAPER
V SEMESTER B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
BASIC TOOLS FOR ECONOMIC ANALYSIS – I (CORE COURSE)

Time: 3 Hours **Maximum Marks: 40**

Part-A (Answer *all* questions. Each question carries 1 mark)

1. Define G.P. with an example.
2. Distinguish between equal sets and equivalent sets.
3. Solve 2x + 3 =5.
4. Define standard deviation.
5. What is meant by skewness.
6. State the mathematical definition of probability. (1 x 6 = 6 marks)

Part-B (Answer any *six* questions. Each question carries 2 marks)

7. If the 7th and 12th terms of an A.P are 20 and 35. Find the series.
8. Find log X if (i) X= 126 × 256.4 and (ii) X= 354 / 236.2
9. Draw the graph of Y = 5X + 4.
10. Distinguish between primary and secondary data.
11. What are the major parts of a table?
12. Explain Lorenz curve.
13. Compute the quartile deviation and inter quartile range for the following values :
    7, 85, 25, 60, 5, 10, 74, 12, 16, 10.
14. Given A, B, C are independent events and P(A) = 0.3, P(B) = 0.2 and P(C)= 0.4. Find the probability for (a) all occurring (b) none occurring (c) at least one occurring and (d) exactly one occurring.

(2 x 6 = 12 marks)

Part-C (Answer any *four* questions. Each question carries 3 marks)

15. Explain the laws of indices.
16. Explain the set operations with suitable examples.
17. A company sells X tins of talcum powder each day at Rs. 30 a tin. The cost of manufacturing and selling these tins is Rs. 20 per tin plus a fixed daily overhead cost of Rs. 1,000. Determine (i) cost function (ii) revenue function and (iii) profit function. What are the total cost, total revenue and total profit when 1000 tins are manufactured and sold a day ? What is the average cost when 10 units are produced ?
18. Briefly explain the different methods of sampling.
19. Define conditional probability and the independence of events.
20. Calculate mean deviation about median from the following data.

Marks	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70	70 - 80
No. of students	4	6	10	20	10	6	4

(3 x 4 =12 marks)

Part-D (Answer any *two* questions. Each question carries 5 marks)

21. Calculate median and mode from the following data.

Wages(in Rs.)	No. of workers
15 - 19	31
20 - 24	47
25 – 29	59
30 – 34	78
35 – 39	104
40 – 44	113
45 – 49	81
50 – 54	60
55 – 59	52
60 – 64	25

22. Calculate coefficient of variation for the following data.

Marks	No. of students
20 - 29	5
30 - 39	12
40 - 49	15
50 - 59	20
60 - 69	18
70 - 79	10
80 - 89	6
90 - 99	4

23. Explain the methods of collecting primary data.

24. Explain the addition and multiplication rules of probability. Give suitable examples.

(5 x 2 =10 marks)

CORE COURSE: MODEL QUESTION PAPER
V SEMESTER B.A DEGREE EXAMINATION-2019
ECONOMICS / DEVELOPMENT ECONOMICS
HETERODOX ECONOMICS

Time: 3 Hours **Maximum: 40 marks**

PART-A

(Answer **all** questions. Each question carries **1** mark)

1. Heterodox economics
2. Neo-classical economics
3. Organic Composition of Capital
4. Materialistic Interpretation of History
5. Neuro economics
6. Innovation (1x6=6)

PART-B

(Answer any **Six** questions. Each question carries **2** marks)

7. Features of institutionalism
8. Labour theory of value.
9. Behavioural economics.
10. Mode of production
11. Immiserisation of the proletariat
12. Feminist economics
13. Concentration and centralization of capital.
14. Distinguish between C-M-C and M-C-M^1 (2x6=12)

PART-C

(Answer any **four** questions. Each question carries **3** marks)

15. State the basic features of mainstream economics
16. Write a short on ecological economics.
17. Examine the relevance of Marxian economics in the modern era.
18. Explain the main ideas of Thorestein Veblen
19. What is trusteeship doctrine?
20. Explain how under consumption leads to capitalist crisis.

(3x4=12)

PATRT-D

(Answer any **two** questions. Each question carries **five** marks)

21. What is heterodox economics? Explain its nature and scope
22. Give an account of Marxian economic ideas.
23. Do you think that Gandhian economics is an alternative to mainstream economics?
24. Compare and contrast heterodoxy and orthodoxy in economics.

(5x2=10

CORE COURSE: MODEL QUESTION PAPER
FIFTH SEMESTER BA DEGREE EXAMINATION
CORE COURSE IN ECONOMICS / DEVELOPMENT ECONOMICS
MACROECONOMICS ANALYSIS I

Time: 3 Hours **Maximum: 40 marks**

Part A - Short answer

Answer all questions

1. State Say’s Law of Markets
2. What is a flow variable?
3. What do you mean by a Laissez – faire Economy?
4. Define Involuntary Unemployment.
5. What is Liquidity trap?
6. State Demonstration effect. (6 x 1 = 6)

Part B - Short Essay

Answer any 6questions

7. Distinguish between Laissez – Faire and State intervention ideologies.
8. What do you mean by Monetarism?
9. State the major postulates of Classical economics
10. State the Quantity theory of Money
11. Distinguish between autonomous and induced consumption.
12. Why the value of Balanced Budget multiplier is always one?
13. What is the relationship between MPC and Investment multiplier?
14. State the concept of Accelerator. *(6× 2 =12)*

Part C - Essay

Answer any 4 questions

15. Write a brief note on the evolution of Macroeconomics.
16. Elucidate the saving – investment equality of Classical Economics.
17. Briefly explain Keynesian concept of Underemployment equilibrium.
18. Distinguish between permanent and transitory concepts of Income and Consumption.
19. Show the working of investment multiplier with the help of an example.
20. Briefly explain the Absolute Income Hypothesis. *(4 × 3 =12)*

Part D - Long Essay

Answer any 2 questions

21. Examine the criticisms leveled against the Classical Economics by J M Keynes.
22. Illustrate the determination of Income in two, three and four sector economies under Keynesian Economics.
23. Distinguish between Inflationary gap and Deflationary gap. Suggest remedies to solve these instabilities.
24. Explain the major Post-Keynesian theories of Consumption.

(2 × 5 =10)

MODEL QUESTION PAPER
V SEMESTER B A DEGREE EXAMINATION-ECONOMICS
(5B10 ECO)
DEVELOPMENT ECONOMICS
(CORE COURSE)

Time: 3 hours **Maximum marks: 40**

Part – A

(Very short answer type Questions- Answer all Questions)

1) Define development economics?
2) Define Human poverty index?
3) What do you meant by structural unemployment?
4) What is development gap?
5) Define the term innovation
6) Explain the concept of take off (6x1=6marks)

Part – B

(Short answer type Questions- Answer any Six Questions)

7) What is the significance of gender development index?
8) Explain the idea of capability by Amartya Sen
9) Explain the core values of development
10) Define the term Solow residual?
11) Distinguish between natural growth rate and warranted growth rate?
12) What are the characteristic features of traditional society according to Rostow?
13) What is organic composition of capital?
14) Distinguish between endogenous and exogenous growth models.

(6x2=12Marks)

Part – C

(Short Essay type Questions-Answer any Four Questions)

15) Define unemployment. What are the types of unemployment?
16) Differentiate between Growth and development?
17) Summarize the neo classical theory of growth by Solow?
18) Explain theory of unlimited supply of labour?
19) Differentiate between balanced growth and unbalanced growth
20) What is the essence of big push theory by Rosenstein-Rodan?

(4x3=12 Marks)

Part – D

(Essay type Questions-Answer any Two Questions)

21) Critically evaluate Marxian theory of development?
22) Explain the relevance of Harrod- Domar theory?
23) Analyses the contributions of Schumpeter to development economics in the light of Innovation theory?
24) Explain the measurement of growth and development and limitations of various measures.

(2x5=10 Marks)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION - 2019
DEELOPMENT ECONOMICS (CORE COURSE)
5B10 DEV ECO: DEVELOPMENT PLANNING: TOOLS AND TECHNIQUES
SEMESTER V

Time: 3hours **Maximum Marks: 40**

Part A

Answer all questions (Each question carries 1 mark)

1. Define economic planning
2. Explain the concept of plan models
3. What do you understand by rolling planning?
4. Explain disguised unemployment
5. Write a note on club of Rome
6. Define peoples planning

(6x1=6marks)

Part B

(Answer any 6 questions -Each question carries 2 marks)

7. What is meant by sustainable development?
8. Explain the term physical planning
9. What do you mean by investment criteria?
10. Explain economic controls
11. What do you understand by the term linear programming

12 Explain the concept of perspective planning

13. Role of shadow prices in economic planning
14. Explain the limitations of planning in India

(6x2=12 Marks)

Part C

(Answer any 4 questions -Each question carries 3 marks)

15. Explain the concept of cost-benefit analysis
16. Explain some anti-poverty programs implemented in India
17. Explain the concept of democratic planning
18. Explain advantages and disadvantages of capital intensive technology
19. Explain the objectives and strategies of 12thfive year plan
20. Explain a short note on Earth Summit at Rio De Geneiro and Recent Developments.

(4x3=12 Marks)

Part D

(Answer any 2 questions -Each question carries 5 marks)

20. Discuss the merits and demerits of major investment criteria.
21. Explain the salient features of planning in India and state its objectives and strategies.
22. Explain the problems and policies of sustainable development
23. Evaluate the sustainability of Kerala model of development and point out emerging challenges

(2x5=10 Marks)

MODEL QUESTION PAPER
ECONOMICS/ DEVELOPMENT ECONOMICS
V SEMESTER B A DEGREE EXAMINATION
ECONOMICS OF BANKING AND FINANCE

Time: 3 Hours **Maximum: 40 Marks**

PART-A

(Answer **all** questions. Each question carries **1** mark)

1 What is financial system?
2 What is SIDBI?
3 What is ATM?
4 What is call money market?
5 What is reverse repo?
6 What is IRDAI? (1x6=6)

PART-B

(Answer any **Six** questions. Each question carries **2** marks)

7 Distinguish between debit card and credit card?
8 What is Treasury bill?
9 Write a note on commercial paper.
10 What is NBFC?
11 Distinguish between primary market and secondary market?
12 What are futures?
13 Write a note on PFRDA.
14 List out the major objectives of SEBI? (2x6=12)

PART-C

(Answer any **four** questions. Each question carries **3** marks)

15 What are the functions of the commercial banks?
16 Explain the term money market. State the main features of Indian money market.
17 What are the functions of IDBI?
18 Explain the principles of sound lending.
19 Examine the role of NABARD in rural credit.
20 Discuss the various kinds of financial derivatives. (3x4=12)

PATRT-D

(Answer any **two** questions. Each question carries **five** marks)

21 Explain the different components of Indian financial system?
22 Explain the innovations and recent trends in commercial banking in India.
23 Explain briefly the banking sector reforms in India.
24 Critically examine the role of RBI and SEBI in regulating Indian financial system.
(5x2=10)

MODEL QUESTION PAPER
VI SEMESTER B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
BASIC TOOLS FOR ECONOMIC ANALYSIS – II

Time: 3 Hours **Maximum Marks: 40**

Part-A (Answer *all* questions. Each question carries 1 mark)

1. Define a lower triangular matrix with an example.
2. Define limit of a function.
3. Define positive and negative correlations with examples.
4. Define simple linear regression.
5. Define secular trend.
6. What is time reversal test? (1 x 6 = 6 marks)

Part-B (Answer any *six* questions. Each question carries 2 marks)

7. Test whether the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 6 & 9 \\ 2 & 4 & 6 \end{bmatrix}$$ is singular or non-singular.

8. Write the relationship among AR, MR and elasticity.
9. Find the marginal cost and average cost from the total cost function $C = 60 + 10x + 15x^2$.
10. Define derivative of a function.
11. Explain scatter diagram method of studying correlation.

12. If the two regression coefficients are – 0.4 and – 0.9, what is the correlation coefficient?
13. Define maxima and minima of a function.
14. Explain Fisher's index number and its importance.

(2 x 6 = 12 marks)

Part-C (Answer any *four* questions. Each question carries 3 marks)

15. Show that $A^3 + 4A^2 - A - 12\,I = 0$ when

$$A = \begin{bmatrix} 0 & 1 & 2 \\ 2 & -3 & 0 \\ 1 & 1 & -1 \end{bmatrix}$$

16. Explain the rules of differentiation.
17. From the following data fit a regression line of X on Y

X	5	6	7	3	2
Y	4	5	8	2	1

18. Explain Karl Pearson's correlation coefficient. What are the merits and demerits?

19. Calculate seasonal indices from the following data by the method of simple averages.

Season	1972	1973	1974	1975
I	75	86	90	100
II	60	65	72	78
III	54	63	66	72
IV	59	80	85	93

20. Explain the construction of consumer price index numbers.

(3 x 4 =12 marks)

Part-D (Answer any *two* questions. Each question carries 5 marks)

21. Solve the system of equations using Cramer's rule :

$5x - 6y + 42 = 15,$
$7x + 4y - 32 = 19,$
$2x + y + 6z = 46.$

22. Calculate Karl Pearson’s correlation coefficient for the following data

X	10	6	9	10	12	13	11	9
Y	9	4	6	9	11	13	8	4

23. Explain the components of time series.

24. Compute Laspeyre’s, Paasche’s and Fisher’s price index from the following data.

Commodities	2004		2005	
	Price	Quantity	Price	Quantity
A	2	8	4	6
B	5	10	6	5
C	4	14	5	10
D	2	19	2	13

(5 x 2 =10 marks)

MODEL QUESTION PAPER
SIXTH SEMESTER BA DEGREE EXAMINATION
CORE COURSE IN ECONOMICS/ DEVELOPMENT ECONOMICS
MACROECONOMIC ANALYSIS II

Time: 3 Hours **Maximum: 40 Marks**

Part A - Short answer

Answer all questions

1. Define IS-LM
2. What would happen to IS if saving increases?
3. What is Demand pull inflation?
4. Define Natural rate of Unemployment.
5. What do you mean by Juglar cycle?
6. Define seigniorage. (6 x 1 = 6)

Part B - Short Essay

Answer any 6questions

7. Show the shifts in general equilibrium due to the increase in demand for money using IS-LM framework.
8. Write a note on Cost push inflation.
9. List out two limitations of IS-LM.
10. What do you mean by Adaptive Expectation?
11. What is Barter system?
12. Which are the Income motives of demand for money?
13. Distinguish between Depression and Prosperity.
14. Distinguish between inside money and outside money.

(6X 2 =12)

Part C - Essay

Answer any 4 questions

15. Show important shifts in IS and LM and the resultant changes in general equilibrium.
16. Distinguish between Short run and Long run Philips curves.
17 Explain the Monetary theory of trade cycles.
18. Examine the Neoclassical synthesis.
19. What are the important measures of money supply in India? Explain.
20. What do you mean by Fischer Effect?

(4 X 3=12)

Part D - Long Essay

Answer any 2 questions

21. Illustrate the integration of Real and Monetary sectors and General equilibrium through IS-LM framework.
22. Examine the important monetary and fiscal weapons to combat Inflation and Unemployment.
23. Compare and contrast between Keynesian and Hayek's theories of trade cycles.
24. Illustrate the Keynesian theory of demand for money. *(2 × 5=10)*

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
PUBLIC ECONOMICS (CORE COURSE)
SEMESTER VI

Time: 3hours Maximum marks 40

Part – A

(Short answer type questions. Answer all questions. Each carries one mark)

1) Private good
2) Progressive Tax
3) Budget
4) Escheats.
5. Sinking Fund
6. Tax incidence (6X 1=6)

Part – B

(Short essay type questions. Answer any **SIX** questions. Each carries two marks)

7) Explain externalities.
8) Describe zero-based budgeting
9) Distinguish between developmental and non-developmental expenditure
10) Describe the characteristics of public good.
11) Distinguish between vertical and horizontal imbalance.
12) Analyse the trends in public expenditure in India.
13) List the features of tax.
14) Explain the major highlights of current year's budget (6 X 2=12)

Part – C

(Essay type questions. Answer any **FOUR** questions. Each carries **three** marks)

15) Describe the fiscal functions of government.
16) Explain the features of GST implemented in India
17) State the canons of public taxation.
18) Define deficit financing. What are the methods of deficit financing?
19) Critically examine the principle of maximum social advantage.
20). Explain the methods of repayment of public debt. (4 X 3=12)

Part – D

(Long essay type questions. Answer any **TWO** questions. Each carries **five** marks)

21) Define public economics. Explain the scope and subject matter of public economics.
22) Explain the sources of public revenue.
23) Briefly explain the major theories of Public expenditure. Examine the reasons for the growth of public expenditure in India.
24) Critically examine the functions of finance commission. What are the major recommendations of latest finance commission? (2 X 5=10)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
BASIC ECONOMETRIC ANALYSIS
SEMESTER VI

Time: 3 Hours **Maximum Marks: 40**

Part-A (Answer all questions. Each question carries 1 mark)

1. Define Econometrics.
2. What is BLUE?
3. Distinguish between Endogenous and Exogenous variables.
4. Distinguish between Population regression function and Sample regression function.
5. What is Panel data?
6. Define Applied Econometrics (1X6=6)

Part-B (Answer any six questions. Each question carries 2 marks)

7. What is the meaning of ‘linear in parameters’?
8. Justify the use of random error term in a regression model.
9. Distinguish between time series data and cross section data.
10. Distinguish between statistical model and econometric model.
11. Explain the concept of Null Hypothesis and Alternative Hypothesis.
12. What are the causes of Autocorrelation?
13. What are the desirable properties of good econometric model?
14. What is the classic symptom of Multicollinearity? (2X6=12)

Part-C (Answer any four questions. Each question carries 3 marks)

15. State the Stochastic assumptions of OLS.
16. Explain Coefficient of determination.
17. Explain Durbin-Watson test for Autocorrelation.
18. Explain any two methods to overcome the problem of Heteroscedasticity.
19. What is meant by non- linear regression model?
20. What are the important goals of Econometrics? (3X4=12)

Part-D (Answer any two questions. Each question carries 5 marks)

21. Briefly explain the meaning and scope of Econometrics and point out its limitations.
22. Discuss the Methodology of Econometrics.
23. Explain in detail Gauss Markov theorem.
24. Briefly explain the detection and remedial measures of Multicollinearity. (5X2=10)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
MATHEMATICS FOR ECONOMIC ANALYSIS-I (COMPLEMENTARY COURSE)
SEMESTER I

Time: 3 Hours **Max. Marks: 40**

Part - A

(Answer all the 6 Questions. Each carries 1 Mark)

1. Define the following: a) Single valued function b) Single variable function
2. If D = 100 – 2p, find the demand for free good
3. Derive the slope of function ax + by + c = 0.
4. Find the elasticity of demand for the demand function q = 27/p3
5. Define function.
6. Define continuity of a function at a point. **(6x1=6 Marks)**

Part – B

(Answer any 6 questions. Each carries 2 Marks)

7. Derive the slope of function ax + by + c = 0.
8. Find the differential coefficient of xy + y2 = 4
9. Differentiate convex and concave function.
10. Differentiate partial and total derivatives.
11. Differentiate x^x .
12. Criterion for minimum value of a function.
13. Find d2 z if z = √x + y
14. What is mean by constraint optimization? **(6x2=12Marks)**

Part – C

(Answer any 4questions. Each carries 3 Marks)

15. Explain briefly different types of functions.
16. Draw the graph of $x^2 = 4y$.
17. When do you say y = f (x) is continuous in the interval (a, b).
18. Define Lagrange multiplier
19. If y = 3x3 – 2x2 + 6x, find $d^4 y/dx^4$.
20. Using L 'Hospital's rules evaluate Lt X →2 x2 – 5x+6 / x2 – 4

(4x3=12 Marks)

Part - D

(Answer any 2questions. Each carries 5 Marks)

21. Define elasticity. If the demand law is p =20/q – 1, find elasticity of demand with respect to price at the point where q = 3.
22. For the production function, 16y2 – y +2(K- 4)2 + 4(L-5)2 – 80 = 0 find marginal productivities.
23. State Euler's theorem and hence properties of homogenous functions. Verify Euler's theorem for the following function u = 3x2 + 2xy +y2
24. Explain the application of derivatives in economics. **(5x2=10 Marks)**

MODEL QUESTION PAPER
B A DEGREE EXAMINATION - 2019
ECONOMICS/DEVELOPMENT ECONOMICS
MATHEMATICS FOR ECONOMIC ANALYSIS-II (COMPLEMENTARY COURSE)
SEMESTER I

Time: 3 Hours **Max. Marks: 40**

Part - A

(Answer all the 6 Questions. Each carries 1 Mark)

1. Define singular matrix
2. Solve ∫(x3 +1/x) dx.
3. Explain trace of a matrix
4. Define the order of a matrix
5. Differentiate between diagonal and non-diagonal matrix
6. Define cofactor matrix

. **(6x1=6 Marks)**

Part – B

(Answer any 6 questions. Each carries 2 Marks)

7. Define Eigen value.
8. Differentiate consumer's surplus with producer's surplus.
9. What is the relationship between total and marginal values in economics?
10. Differentiate symmetric and skew symmetric matrix.
11. Mention any two properties of determinants.

12 What is the present value of a perpetual cash flow of Rs.1, 450 per year discounted at v = 5%?

13. Integrate $e^x - 1/x$.
14. Marginal Revenue function is given as 100 – 8q. Calculate Total Revenue when q = 14. explain gauss elimination method

(6x2=12 Marks)

Part – C

(Answer any 4questions. Each carries 3 Marks)

15. Is it possible for a matrix to be its own inverse?
16. Integrate $(x^2. e^{x)}$ dx.
17. Find the rank of matrix A if A = $\begin{matrix} 1 & 4 & 0 \\ 2 & 5 & 0 \\ 3 & 6 & 0 \end{matrix}$
18. Write the Lagrangian function for U = (x+2) (y+1) and Px = 4, Py = 6 and B = 130 and find the optimal level of purchase x* and y*.
19. If Marginal Cost of a firm is given by MC = 3q2 - 4q + 5, find out TC given that fixed cost is Rs. 100.
20. Evaluate $\begin{matrix} 1 & 2 & 5 \\ 2 & 3 & 1 \\ -1 & 1 & 1 \end{matrix}$

(4x3=12 Marks)

Part – D

(Answer any 2questions. Each carries 5 Marks)

21. Using Cramer's rule, solve: 4x + 3y -2z = 1, x + 2y = 6, 3x + z = 4
22. Explain the basic properties of definite Integrals.
23. Find the consumers surplus and producers surplus for the demand curve $d(x)=16-x^2$ and supply curve s(x)=4+x.
25. If $MR=16-x^2$.Find the maximum total revenue also find AR and demand function

(2x5=10 Marks)

MODEL QUESTION PAPER
BA DEGREE EXAMINATION
ECONOMICS / DEVELOPMENT ECONOMICS
MATHEMATICAL ECONOMICS – I (COMPLEMENTARY COURSE)
SEMESTER - III

Time: 3 Hours **Max. Marks: 40**

Part - A

(Short answer type questions. Answer all questions. Each carries one mark)

1. Define cross elasticity of demand
2. Describe Cardinal utility
3. Define discriminating monopoly
4. If the price of the commodity is Rs.10 and marginal revenue is Rs.20, price elasticity of demand is ....
5. Given the total revenue function, $R = 50x - 3x^2$, marginal revenue function is..............
6. If TR = 20x and TC = 5x + 2, then profit function is .... (6 x 1 = 6)

Part - B

(Short essay type questions. Answer any **SIX** questions. Each carries two marks)

7. Distinguish between ordinary demand function and compensated demand function.
8. Explain homogeneous and homothetic utility functions.
9. State the first and second order conditions for profit maximisation of a firm under perfect competition.
10. Explain the properties of indifference curves.
11. Find price elasticity of demand for the demand function $Q = 1400 - P^2$ at P = 20
12. Find marginal cost and average cost for the total cost function $TC = 3Q^2+7Q+12$ at Q = 3.
13. Let the demand function for a commodity be P = 25 - 9x, where P is the price and 'x' is the quantity demanded, find marginal revenue.
14. Find equilibrium price for a commodity when demand and supply functions are $Q_d = 25p - 20$ and $Q_s = 5p + 80$ respectively. (6 x 2 =12)

Part - C

(Essay type questions. Answer any **FOUR** questions. Each carries **three** marks)

15. Explain the role of mathematics in economics.
16. Find out consumer's equilibrium level of consumption of commodity x and y, given the utility function, U = f (x,y), P_1 = Rs.5, P_2 = Rs.5 and consumers money income, M=Rs.50.
17. Explain the mathematical relationship between AR, MR and Price elasticity of demand.
18. Given Q1 = 50 – 4P1 - 3P2 + 2P3 + 0.001Y. At P1 = 5, P2 = 7, P3 = 3,Y = 11000 and Q_1 =26 use cross elasticity to determine the relationship between good 1 and the other two goods.
19. Evaluate the elasticity of substitution of production function, $Q = A[\alpha K^{-\beta} + (1-\alpha)L^{-\beta}]^{-1/\beta}$
20. For a firm under perfect competition, the demand function is given as P = 100 – 0.01Q where Q is weekly production. The cost curve is given by C = 50Q + 30,000. Calculate equilibrium price and quantity. (4 x 3 = 12)

Part - D

(Long essay type questions. Answer any **TWO** questions. Each carries **five** marks)

21. Explain the constraint utility maximisation.
22. Derive Slutsky equation and interpret the results.
23. Explain the properties of Cobb-Douglas Production function.
24. A producer has the possibility of discriminating between domestic and foreign markets for a product where the demand functions are $Q_1 = 21 - 0.1P_1$ and $Q_2 = 50 - 0.4P_2$. Given the total cost function, TC = 2000+10Q where, $Q = Q_1 + Q_2$ what price the producer will charge in order to maximise profit with discrimination between markets and without discrimination.

(2 x 5 = 10)

MODEL QUESTION PAPER
BA DEGREE EXAMINATION
ECONOMICS / DEVELOPMENT ECONOMICS
MATHEMATICAL ECONOMICS – II (COMPLEMENTARY COURSE)
SEMESTER - IV

Time: 3 Hours Max. Marks: 40

Part - A

(Short answer type questions. Answer all questions. Each carries one mark)

1. Define objective function of a linear programming problem.
2. Write a note on input output table.
3. Define payoff of a game.
4. ----------- are the mirror image problems of primal linear programming problems.
5. The open static input output model was developed by -------------
6. When pay-off of one player is equal to the loss of another, the game is called--------- game.

(6 x 1 = 6)

Part - B

(Short essay type questions. Answer any **SIX** questions. Each carries two marks)

7. Explain technical constraints and optimal solution in linear programming.
8. Distinguish between slack and surplus variables.
9. State any four applications of linear programming.
10. Explain Technological matrix.
11. Distinguish between open and closed input output table.
12. Describe two person zero sum game
13. Explain Maximin and Minimax strategy of a game theory
14. Explain the concept of Nash equilibrium. (6x 2 = 12)

Part - C

(Essay type questions. Answer any **FOUR** questions. Each carries **three** marks)

15. Write down the dual of the following linear programming problem.

Minimize, $Z = 6X_1 + 4X_2 + X_3$
Sub. to, $X_1 + X_2 \leq 10$
$3X + X_2 + X_3 \geq 23$
$7X_1 - X_3 \geq 6$
$X_1, X_2, X_3 \geq 0$

16. State the Hawkins-Simon Conditions for viability of an input-output system. Given the technological coefficient matrix, $A = \begin{bmatrix} 0.2 & 0.4 \\ 0.3 & 0.5 \end{bmatrix}$, verify this system is viable or not .

17. The technological matrix of a two sectors, X and Y is given by $A = \begin{bmatrix} 0.3 & 0.3 \\ 0.4 & 0.6 \end{bmatrix}$. If the final demand of the two sectors are 10 and 40 respectively, find the gross output of the two sectors.

18. What is meant by Saddle point in game theory. From the following pay off matrix, find the optimal strategies for both players and the saddle point.

$$\begin{array}{cc} & \text{Player B} \\ \text{Player A} & \begin{bmatrix} 15 & 2 & 3 \\ 6 & 5 & 7 \\ -7 & 4 & 0 \end{bmatrix} \end{array}$$

19. Solve the following game by Principle of dominance.

$$\begin{array}{cc} & \text{Player B} \\ \text{Player A} & \begin{bmatrix} 8 & 10 & 9 & 14 \\ 10 & 11 & 8 & 12 \\ 13 & 12 & 14 & 13 \end{bmatrix} \end{array}$$

20. Explain Prisoner's Dilemma in game theory. (4 x 3 = 12)

Part - D

(Long essay type questions. Answer any **TWO** questions. Each carries **five** marks)

21. Solve the following linear programming problem by graphic method.

$$\begin{aligned} &\text{Maximise, } Z = 24X_1 + X_2 \\ &\text{Subject to, } 4X_1 + X_2 \le 20 \\ &2X_1 + 5X_2 \le 40 \\ &10X_1 + 5X_2 \le 60 \\ &X_1, X_2 \ge 0 \end{aligned}$$

22. Solve the following LPP problem using Simplex method.

$$\begin{aligned} &\text{Maximise, } Z = 5X_1 + 3X_2 \\ &\text{Subject to, } X_1 + X_2 \le 2 \\ &5X_1 + 2X_2 \le 10 \\ &3X_1 + 8X_2 \le 12 \\ &X_1, X_2 \ge 0 \end{aligned}$$

23. Given the technology matrix A and final demand vector F, find the gross output of the three sectors.

$$A = \begin{bmatrix} 0.3 & 0.4 & 0.1 \\ 0.5 & 0.2 & 0.6 \\ 0.1 & 0.3 & 0.1 \end{bmatrix} \qquad F = \begin{bmatrix} 20 \\ 10 \\ 30 \end{bmatrix}$$

24. Solve the following game problem graphically.

$$\begin{array}{cc} & \text{Player B} \\ \text{Player A} & \begin{bmatrix} 2 & -4 & 6 & -3 & 5 \\ -3 & 4 & -4 & 1 & 0 \end{bmatrix} \end{array}$$

(2 x 5 = 10)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS
INTRODUCTORY ECONOMICS-I (COMPLEMENTARY COURSE)
SEMESTER I

Time: 3 hours **Maximum marks: 40**

Part – A
Answer all Questions. Each Carries One Mark

1) Define Economics.
2) Distinguish between cardinal and ordinal utility?
3) Concept of quasi rent.
4) What is selling cost?
5) Distinguish between micro and macro economics?
6) Define production function 1x6=6

Part – B
Answer any Six Questions. Each Carries Two Marks

7) What are the features of perfect competition?
8) Distinguish between price elasticity and cross elasticity of demand?
9) What is production possibility curve?
10) Define consumer surplus.
11) What do you meant by product differentiation?
12) Differentiate between expansion and contraction of demand.
13) What is the relation between average cost and marginal cost?
14) Explain the central problems of the economy. 2x6=12

Part – C
Answer any Four Questions. Each Carries Three Marks

15) What are the properties of an indifference curve?
16) Discuss about the functions and limitations of price mechanism?
17) Define elasticity of demand .what are the different degrees of elasticity of demand?
18) State the law of demand. What are its exceptions?
19) State law of variable proportion?
20) Explain consumer surplus. 3x4=12

Part – D
Answer any Two Questions. Each Carries Five Marks

21) Critically examine marginal productivity theory of distribution?
22) How price and output is determined under monopolistic competition in the long run?
23Explain various definitions of economics
24) What is production? Explain the short run and long run laws of production?

2x5=10

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS
INTRODUCTORY ECONOMICS-II (COMPLEMENTARY COURSE)
SEMESTER II

Time: 3 hours **Maximum marks: 40**

Part – A

Answer all Questions. Each Carries One Mark

1) Distinguish between CRR and SLR?
2) Define public debt
3) What is GNP?
4) Define money.
5) What is an open market operation?
6) Define poverty.

1x6=6

Part – B

Answer any Six Questions. Each Carries Two Marks

7) Distinguish between absolute poverty and relative poverty.
8) What are non tax revenue items?
9) Distinguish between repo and reverse repo rate
10) What is moral suasion?
11) Explain decentralized planning in Kerala.
12) What is disguised unemployment?
13) Distinguish between surplus budget and deficit budget?
14) Define money. What are the functions of money?

2x6=12

Part – C

Answer any Four Questions. Each Carries Three Marks

15) What are the sources of public revenue?
16) Explain the principles of budgeting.
17) What do you meant by inequality? Discuss about different types of inequality in India.
18) What is inflation? Discuss about different types of inflation.
19). Explain the limitations associated with national income calculation
20) Explain the methods of debt redemption.

3x4=12

Part – D

Answer any TWO Questions. Each Carries Five Marks

21) Explain Kerala model of development
22) Distinguish between direct and indirect tax. Explain the merits and demerits of direct and indirect taxes in India.
23)? Describe the functions of RBI. Explain the qualitative and quantitative credit control methods of RBI?
24) What is black money? Examine the causes and measures taken by government of India to

2x5=10

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
HISTORY OF ECONOMIC THOUGHT-I
(COMPLEMENTARY ELECTIVE COURSE)
SEMESTER III

Time: 3 hours **Maximum marks: 40**

Part A

Answer all questions (Each question carries 1 mark)

1. Mercantilism
2. Invisible hand
3. Classicism
4. Just price
5. Democratic socialism
6. Stationary state

1x6=6

Part B

Answer any 6 questions (Each question carries 2 marks)

7. Economic ideas of Physiocracy
8. Laissez faire
9. Utopian Socialism
10. Theory of Market glut
11. Reciprocal demand
12. Naturalism and Optimism
13. Immiserisation of the proletariat
14. Utilitarianism

2x6=12

Part C

Answer any 4 questions (Each question carries 3 marks)

15. Canons of Taxation
16. Ricardian theory of rent
17. Contributions of Sismondi
18. I R A
19. Malthusian theory of population
20. Factors responsible for the rise of mercantilism

3x4=12

Part D

Answer any 2 questions (Each question carries 5 marks)

21. Evaluate the contribution of Ancient thinkers to Economic Thought
22. Give a brief account of Marxian ideas
23. Explain the contributions of Utopian socialists
24. Explain Say’s Law of Market. What are the implications of this law?

2x5=10

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS
HISTORY OF ECONOMIC THOUGHT-II
(COMPLEMENTARY ELECTIVE COURSE)
SEMESTER IV

Time: 3 hours **Maximum marks: 40**

Part A

Answer all questions (Each question carries 1 mark)

1. Gossen's first Law
2. Effective demand
3. Institutionalism
4. Multiplier
5. Brain drain
6. Quasi-rent

1x6=6

Part B

Answer any 6 questions (Each question carries 2 marks)

7. Doctrine of Trusteeship
8. Ideas of Carl Menger
9. The 'Drain Theory'
10. Fisher's equation of Exchange
11. Economic thought of Koutilya
10. Ranade's ideas on the role of the state
11. Difference between classical and neo-classical approach
12. What are the features of Ancient Indian Economic Thought

2x6=12

Part C

Answer any 4 questions (Each question carries 3 marks)

13. Give a brief account of the contributions of Elinor Ostrom.
14. Explain the contributions of Wicksell and Wicksteed to Economic thought
15. Explain the Keynesian Theory of Employment
16. State the contributions of Amartya Sen
19. Explain the features of Marginalist School
20. Briefly explain the contributions of Leon Walras

3x4=12

Part D

Answer any 2 questions (Each question carries 5 marks)

21. Explain the contributions of Alfred Marshall to Economic Thought
22. Evaluate the salient features of Gandhian Economic Thought
23. Give a brief account of the contributions of Naoroji to Economic Thought
24. Assess the contributions of Keynes to the development of Modern Economic Thought

5x2=10

MODEL QUESTION PAPER
B.A DEGREE EXAMINATION-
ECONOMICS/ DEVELOPMENT ECONOMICS
POPULATION AND DEVELOPEMNT (COMPLEMENTARY COURSE)
SEMESTER I

Time: Three Hours Maximum Marks: 40

Part A

(Very short answer type questions) Answer all Questions

1. Define Population study
2. Migration
3. Age Pyramid
4. Infant Mortality
5. Population projection
6. Crude Birth Rate

(6 x 1= 6)

Part B

(Short answer type questions) Answer Any **SIX** Questions

7. What are the difference between demography and population study
8. Explain the nature and scope of population study
9. What are the important sources of population data?
10. Explain the term Zero Population growth
11. What you mean by National Population Register
12. Distinguish between positive checks and preventive checks
13. Difference between Gross Reproduction Rate and Net Reproduction Rate.
14. What is demographic Transition? (6 x 2 = 12)

Part C

(Short Essay type questions) Answer Any **FOUR** Questions

15. What are the different measures of fertility?
16. Explain the subject matter of population study
17. Explain briefly the important features of National Population Policy of India
18. Explain Evert Lee's theory of Migration
19. Explain the different components population change
20. What are the important methods of population projection (4 x 3 = 12)

Part D

(Essay type questions) Answer Any **TWO** Questions

21. Briefly explain the inter relationship between population and economic growth
22. Compare and contrast Malthusian and Optimum theory of population.
23. Briefly explain the causes and consequences of Urbanisation
24. Compare the population growth trend in India and Kerala.

(5 x 2 = 10)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
ECONOMIC GEOGRAPHY (COMPLEMENTARY COURSE)
SEMESTERII

Time: Three hours **Maximum marks: 40**

Part – A

(Answer all Questions. Each question carries 1 mark)

1. Define economic geography
2. What is Cluster?
3. Define Space
4. What is Agglomeration?
5. What is Periphery?
6. Define FDI (1x6=6)

Part – B

Answer any Six Questions. Each question carries 2 marks)

7. Explain the inter-disciplinarily approach in economic geography
8. Prepare a note on world economic geography of growth and development
9. Examine the spatial division of labour theory
10. Explain Emanuel's core periphery theory
11. Examine the factors behind regional disparities in India
12. Prepare a note on decentralized planning for regional development in India
13. Examine the spatial planning for urban development in India
14. Explain the problems faced by agriculture in India

2x6=12

Part – C

(Answer any four Questions. Each question carries 3 marks)

15. Examine the regional inequality in industrial development in India
16. Explain the regional disparity in income in India
17. Examine the role of five year plans in reducing regional inequality
18. Examine the various key concepts in economic geography
19. Explain the Marxist approach to the uneven development
20. Critically evaluate Krugman's center periphery model

2x4=12

Part – D

(Answer any two Questions. Each question carries 5 marks)

21. Explain the philosophy, nature and significance of economic geography
22. Critically evaluate central place theory of industrial location
23. Critically evaluate the cumulative causation theory of regional inequality
24. Examine the regional disparity poverty and unemployment since liberalization in India

2x5=10

MODEL QUESTION PAPER
B A DEGREE EXAMINATION - 2019
ECONOMICS/DEVELOPMENT ECONOMICS
GENDER ECONOMICS (COMPLEMENTARY COURSE)
Semester IV

Time: 3**hours** **Maximum Marks: 40**

Part A

Answer all questions (Each question carries 1 mark)

1. Morbidity
2. GEM
3. Gender Equity
4. Sex
5. Feminization
6. LGBTQ

1x6=6

Part B

Answer any 6 questions (Each question carries 2 marks)

7. "Gender is not static or immutable" Explain.
8. Define feminity and masculinity
9. Explain LFPR
10. What do you mean by gender discrimination?
11. Explain gender stratification
12. Explain ICDS
13. Patriarchal and matriarchal families
14. Explain why dowry system is prohibited by law?

2x6=12

Part C

Answer any 4 questions (Each question carries 3 marks)

15. Discuss the status of women law makers in India.
16. Evaluate the role of Kudumbasree in women empowerment.
17. Explain some major determinants of women's wage.
18. Discuss the impact of technology and modernization on women workers.
19. Distinguish between WID and WAD approach
20. Discuss various schemes to develop and empower women entrepreneurs in India

3x4=12

Part D

Answer any 2 questions (Each question carries 5 marks)

22. Do you think that the participation of women in the work force will bring changes in their status? Substantiate your answer with reference to Indian conditions.
23. Examine the problems faced by women in labour market.
24. Explain the important women empowerment programmes in India with special reference to Kerala.
25. Explain the gender inequalities in education, health and nutrition.

2x5=10

MODEL QUESTION PAPER
B A DEGREE EXAMINATION - 2019
ECONOMICS/DEVELOPMENT ECONOMICS
AGRICULTURAL ECONOMICS (COMPLEMENTARY COURSE)

Time: 3**hours** **Maximum Marks: 40**

Part A - **Short answer**: **Answer all questions**

1. What do you mean by New Agricultural Strategy?
2. Define Regulated Market.
3. Define crop insurance.
4. Define Organic Farming.
5. What is do you mean by consolidation of holding?
6. What is the meaning of food security? (6 x 1 = 6)

Part B - **Short Essay**

Answer any 6questions

7. Write about Floor level Price Policy.
8. What is the role of FCI in India?
9. Write a note on NABARD.
10. Write a brief note on National Agricultural Policy.
11. Distinguish between complementary and supplementary production.
12. Write a brief note on the scope of Agricultural Economics.
13. What are the major problems of Agricultural Marketing in India?
14. Write a note on Agricultural Subsidies. *(6x 2 =12)*

Part C - Essay

Answer any 4 questions

15. Write a brief note on the role of Agriculture in Economic Development.
16. What are the important linkages between agriculture and non-agricultural sectors?
17. What are the important measures of Land Reforms?
18. Write a note on sustainable agriculture.
19. State the major issues of Kerala Agriculture.
20. Briefly explain about New Economic Policy and Agriculture. *(4 x 3 =12)*

Part D - **Long Essay**

Answer any 2 questions

21. Examine the growth and performance of Indian Agriculture during the Five Year Plans.
22. Critically evaluate the Land Reforms measures introduced in Kerala.
23. What are the impacts of WTO and Regional Trade Agreements on India n Agriculture?
4. Explain the important sources of Agricultural credit in India.

(2 x 5 =10)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION -
ECONOMICS/DEVELOPMENT ECONOMICS
BASICS OF ECONOMICS (GENERIC ELECTIVE COURSE)
SEMESTER-V

Time: Two hours **Maximum marks: 20**

Part A

Answer all questions (Each question carries 1 mark)

1. Product Differentiation
2. National Income
3. Law of Demand

1x3=3

Part B

Answer any 3 questions (Each question carries 2 marks)

7. Distinguish between micro and macro economics
8. What are the factors that lead to a shift in the demand curve?
9. Distinguish Economic Growth and Economic Development
10. What are the functions of money?

(2x3=6)

Part C

Answer any 2 questions (Each question carries 3 marks)

11. Write down the features of perfect competitive market.
12. Explain the nature and scope of economics.
13. What are the features of mixed economy? (3x2=6)

Part D

Answer any 1 question (Each question carries 5 marks)

13. "Economics is a science of choice making." Explain the relationship between scarcity and choice in the light of this statement.
14. Explain the causes of Poverty, Unemployment and Inequalities.

1x5=5

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
DEVELOPMENT ISSUES OF INDIAN ECONOMY
(GENERIC ELECTIVE COURSE) SEMESTER-V

Time: 2 Hours **Maximum: 20 Marks**

PART-A

(Answer **all** questions. Each question carries **1** mark)

1. What is poverty line?
2. Define unemployment?
3. What is inclusive growth?

(3×1=3marks)

PART-B

(Answer any **three** questions. Each question carries **2** marks)

4. Distinguish between absolute poverty and relative poverty.
5. What is labour force participation rate?
6. What is basic needs approach?
7. Define disguised unemployment?

(3×2=6marks)

PART-C

(Answer any **two** questions. Each question carries **3** marks)

8. Explain the extent and magnitude of poverty in India?
9. Briefly explain the informalisation of labour in India?
10. Explain different types of unemployment in India?

(2×3=6marks)

PATRT-D

(Answer any **one** question. Each question carries **five** marks)

11. Critically evaluate the poverty eradication programmes in India since 1991?
12. Explain the causes of poverty, unemployment and inequality in India?

(5×1=5marks)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION - 2019
ECONOMICS/DEVELOPMENT ECONOMICS
KERALA ECONOMY (GENERIC ELECTIVE COURSE)
SEMESTER-V

Time: Two hours **Maximum marks: 20**

Part – A (Very short answer type Questions). Answer all Questions.

1) What is demographic transition?

2) What is food security?

3) Define inmigration.

(1x3=3)

Part – B (Short answer type Questions) Answer any Three Questions

4) What is the nature and extent of unemployment in Kerala?

5) Explain the recent trends in the service sector of Kerala.

6) Write a note on traditional industries in Kerala.

7) Discuss the issue of population ageing in Kerala?

(2x3=6)

Part – C (Short Essay type Questions) Answer any two Questions

8) Critically examine the recent fiscal crisis of Kerala?

9) Discuss about the implications of demographic transition in Kerala?

10) What do you understand by “Kerala model of development”?

(3x2=6)

Part – D (Essay type Questions) Answer any one Question

11) Define decentralization. Discuss about the impact of decentralization policy on service sector?

12) Critically examine the role of service sector in Kerala’s development.

(5x1=5)

MODEL QUESTION PAPER
DEGREE EXAMINATION
FUNDAMENTALS OF BUDGET
(GENERIC ELECTIVE COURSE)
SEMESTER V

Time: 2 hours Max. Marks: 20

Part – A

(Short answer type questions. Answer all questions. Each carries **ONE** mark)

1) Describe the difference between tax evasion and tax avoidance.

2) Define Zero based budget.

3) Explain how progressive tax is different from proportional tax.

(1x3=3)

Part – B

(Short Essay type questions. Answer any **Three** questions. Each carries **TWO** marks)

4) Explain progressive, proportional and regressive taxes.

5) Examine the different types of deficit concepts.

6) Critically analyse the reasons for the growth of public expenditure.

7) Discuss the major highlights of current year's budget.

(2x3=6)

Part –C

(Short Essay type Questions) Answer any two Questions each carries 3 marks

8) Distinguish between surplus budget and deficit budget.

9) Explain the functions of finance commission.

10) Discuss the major highlights of current year's Union budget

(2x3=6)

Part –D

(Essay type questions. Answer any **ONE** question. Each carries **SIX** marks)

11) Explain the sources of public revenue.

12) Describe the budgetary procedures of central government in India.

(1 x 5= 5)

MODEL QUESTION PAPER
B A DEGREE EXAMINATION
ECONOMICS/DEVELOPMENT ECONOMICS
INDIAN ECONOMY IN THE POST REFORM PERIOD
(GENERIC ELECTIVE)
SEMESTER-V

Time: Two hours **Maximum marks: 20**

Part – A

Very short answer type Questions). Answer all Questions.

1) What is globalization?
2) What are the functions of World Trade Organization?
3) Define neoliberalism

(3x1=3Marks)

Part – B

(Short answer type Questions) Answer any Three Questions

4) What are the features of reforms of agricultural sector?
5) Explain the issue of casualisation of labour.
6) What do you meant by privatization? Is privatization of service sectors an appropriate policy decision?

(3X2=6 Marks)

Part – C

(Short Essay type Questions) Answer any two Questions

7) Evaluate sectoral wise growth pattern after reforms.
8) discuss the objectives of New Industrial Policy -1991
9) Explain the inclusive growth strategy and policies
10) Explain the service led growth in reforms period.

(2x3=6 Marks)

Part – D

(Essay type Questions) Answer any one Question

11) Explain features of the economic crisis faced by India in 1990's.What are major reforms initiatives in India
12) Define globalization. Explain the impact of globalization on poverty and unemployment in India

(1x5=5 Marks)

KANNUR UNIVERSITY

(Abstract)

B.Sc. Mathematics Programme-Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/13083/2019 Civil Station P.O, Dated 22/06/2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O No. Acad.C2/429/2017 Vol.II dated 03-06-2019
4. The Minutes of the Meeting of the Board of Studies in Mathematics held on 06/06/2019
5. Syllabus of B.Sc. Mathematics Submitted by the Chairperson, Board of Studies in Mathematics (UG)dated 21/06/2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes, such as conducting the meeting of various Boards of Studies, Workshops, discussion etc.

3. The Revised Regulation for UG programmes in Affiliated colleges under Choice Based Credit and Semester System (in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently, as per paper read (4) above, the Board of Studies in Mathematics (UG) finalized the Scheme, Syllabus & Pattern of Question Papers for Core, Complementary Elective & Generic Elective Course of B.Sc.Mathematics Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Mathematics(UG) has submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers of B.Sc.Mathematics Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Papers (Core/Complementary Elective/Generic Elective Course) of the B.Sc.Mathematics programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Papers of the B.Sc. Mathematics Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To

The Principals of Colleges offering B.Sc. Mathematics programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in Mathematics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer (for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES, MATHEMATICS (UG)

SYLLABUS FOR
MATHEMATICS CORE COURSE,
COMPLEMENTARY ELECTIVE COURSES
AND GENERIC ELECTIVE COURSES

CHOICE BASED CREDIT AND SEMESTER SYSTEM

(2019 ADMISSION ONWARDS)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision

To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission

- ➢ To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- ➢ To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- ➢ To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher education and to cater to the modern notions of equity, social justice and merit in all educational endeavours.
- ➢ To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- ➢ To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.
- ➢ To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY

PROGRAMME OUTCOMES (PO)

PO 1. Critical Thinking

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

PO 2. Effective Citizenship

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3. Effective Communication

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4. Interdisciplinarity

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

Modern education is facing challenges to cater to the requirements of the expanding world of knowledge and information. Research studies in Basic Sciences, especially in Mathematics is to be encouraged in our country. Novel developments in the field of Mathematics are to be incorporated into the syllabus so as to cope with the challenges of ever growing field of knowledge.

The UG Board of Studies in Mathematics has designed a syllabus that familiarizes the students with the basic concepts of the subject. It helps the students to meet the current employment requirements and provides them ample scope for further study in the subject. The syllabi for Core Courses, Complementary Elective Courses and Generic Elective Courses promote self learning through assignments, seminars and project work in addition to class room learning.

The syllabus and curriculum has been prepared after concerted efforts and deliberations at various levels and it meets the programme specific outcomes. The reference materials have been recommended after a thorough study. The Board of Studies puts forward this syllabus for implementation from 2019 admission onwards. We thank all those who have helped us by giving critical suggestions for improvement.

Dr. C.P. Santhosh
Chairman
UG Board of Studies in Mathematics
Kannur University

KANNUR UNIVERSITY

PROGRAMME SPECIFIC OUTCOMES OF B.SC. MATHEMATICS PROGRAMME

PSO 1: Understand the basic concepts and tools of Mathematical logic, Set theory, Number theory, Geometry, Calculus, Algebra, Abstract structures, Linear Algebra, Analysis, Laplace transforms, Fourier series, Graph theory, and Optimization and methods of proofs.

PSO 2: Model real world problems into Mathematical problems and find solutions and understand the application of Mathematics in other Sciences and Engineering.

INDEX

KANNUR UNIVERSITY

BSc MATHEMATICS PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

Semester	Course Title	Credits	Hours per week	Total Credits	Total Hours
I	English Common Course 1	4	5	20	25
	English Common Course 2	3	4		
	Additional Common Course 1	4	4		
	Core Course 1	4	4		
	First Complementary Elective Course 1	3	4		
	Second Complementary Elective Course 1	2	4		
II	English Common Course 3	4	5	20	25
	English Common Course 4	3	4		
	Additional Common Course 2	4	4		
	Core Course 2	4	4		
	First Complementary Elective Course 2	3	4		
	Second Complementary Elective Course 2	2	4		
III	English Common Course 5	4	5	17	25
	Additional Common Course 3	4	5		
	Core Course 3	4	5		
	First Complementary Elective Course 3	3	5		
	Second Complementary Elective Course 3	2	5		
IV	English Common Course 6	4	5	21	25
	Additional Common Course 4	4	5		
	Core Course 4	4	5		
	First Complementary Elective Course 4	3	5		
	Second Complementary Elective Course 4 (T+P)	6(2+4)	5		
V	Core Course 5	4	4	21	25
	Core Course 6	4	5		
	Core Course 7	4	5		
	Core Course 8	3	4		
	Core Course 9	4	5		
	Generic Elective Course	2	2		
VI	Core Course 10	4	5	21	25
	Core Course 11	4	5		
	Core Course 12	4	5		
	Core Course 13	4	5		
	Core Course 14 (Discipline Specific Elective Course)	3	5		
	Project	2	---		
Total				**120**	

CREDIT DISTRIBUTION STATEMENT

Course	Credit
English Common Course	22
Additional Common Course	16
Core Course	56
First Complementary Elective Course - Statistics	12
Second Complementary Elective Course - Physics/Computer Science	12
Generic Elective Course	2
Total	**120**

PART A

MATHEMATICS CORE COURSES
WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEM.	HOURS PER WEEK	CREDIT	EXAM HOURS
1B01 MAT	Set Theory, Differential Calculus and Numerical Methods	I	4	4	3
2B02 MAT	Integral Calculus and Logic	II	4	4	3
3B03 MAT	Analytic Geometry and Applications of Derivatives	III	5	4	3
4B04 MAT	Number Theory and Applications of Integrals	IV	5	4	3
5B05 MAT	Set Theory, Theory of Equations and Complex Numbers	V	4	4	3
5B06 MAT	Real Analysis I	V	5	4	3
5B07 MAT	Abstract Algebra	V	5	4	3
5B08 MAT	Differential Equations and Laplace Transforms	V	4	3	3
5B09 MAT	Vector Calculus	V	5	4	3
5D-----	Generic Elective Course	V	2	2	2
6B10 MAT	Real Analysis II	VI	5	4	3
6B11 MAT	Complex Analysis	VI	5	4	3
6B12 MAT	Numerical Methods, Fourier Series and Partial Differential Equations	VI	5	4	3
6B13 MAT	Linear Algebra	V	5	4	3
DISCIPLINE SPECIFIC ELECTIVE		VI	5	3	3
6B14A MAT	Graph Theory				
6B14B MAT	Operations Research				
6B14 C MAT	Cryptography				
6B14D MAT	Fuzzy Mathematics				
6B14E MAT	Programming in Python				
6B15 MAT	Project	VI	---	2	---

EVALUATION

ASSESSMENT	**WEIGHTAGE**
EXTERNAL	4
INTERNAL	1

CONTINUOUS INTERNAL ASSESSMENT

COMPONENT	**WEIGHTAGE**	**MARKS**	**REAMARKS**
COMPONENT1- ASSIGNMENT / SEMINAR / VIVA-VOCE	50%	6	For each course, a student has to submit one assignment/ attend one seminar/ attend one viva-voce
COMPONENT 2- TEST PAPER	50%	6	For each course, a student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.
TOTAL	100%	**12**	

- **Use of Scientific Calculators below 100 functions (that is, upto fx 99) shall be permitted for all the above courses.**

CORE COURSE 1:
SET THEORY, DIFFERENTIAL CALCULUS AND NUMERICAL METHODS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
I	1B01 MAT	4	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand Relations and Functions
CO2	Understand limit of a function, limit laws, continuity, Inverse functions and their derivatives
CO3	Understand successive differentiation and Leibnitz theorem
CO4	Understand functions of several variables, limit and continuity, partial derivatives, chain rule, homogenous functions and Euler's theorem on homogenous functions
CO5	Understand bisection method, Regula-falsi method and Newton-Raphson method to solve algebraic and transcendental equations

1B01 MAT:
Set Theory, Differential Calculus and Numerical Methods

Unit I - Relations and Functions (22 hours)

Relations, Types of relations, Partitions, Equivalence relation, Partial ordering relation, Functions, Composition of functions, One-to-one, onto and invertible functions, Mathematical functions, exponential function, logarithmic function (Sections 3.3, 3.6, 3.8, 3.9, 3.10 and sections 4.1 to 4.5 of Text 1).

Unit II – Limit, Continuity and Successive differentiation (18 hours)

Limit of a function and limit laws, continuity, Inverse functions and their derivatives (Sections 2.2, 2.5, 7.1 of Text 2. Proof of Theorem 10 in section 2.5 is omitted).

Successive differentiation, standard results, n^{th} derivatives, Leibnitz theorem (Sections 4.1, 4.2 of Text 3).

Unit III – Functions of several variables (22 hours)

Functions of several variables, limit and continuity, partial derivatives, chain rule (theorems without proof) (Sections 14.1, 14.2, 14.3, 14.4 of Text 2).

Homogenous functions, Euler's theorem on homogenous functions (Sections 11.8, 11.8.1 of Text 4).

Unit IV - Solution of Algebraic and Transcendental Equations (10 Hours)

Introduction to solution of algebraic and transcendental equation**,** Initial approximations,

Bisection method, Regula-falsi method, Newton-Raphson method (Sections 3.2, 3.2.1, 3.3, 3.4, 3.5 of Text 5).

Texts
1. S. Lipschutz, Set Theory and Related Topics (2nd edition), Schaum's Series
2. G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12th edition), Pearson Education
3. Higher Engineering Mathematics, B.S. Grewal (43rd edition), Khanna Publishers
4. S Narayan and P.K Mittal , Differential calculus, Revised Edition, S. Chand & Company Ltd
5. S. R. K. Iyengar and R. K. Jain, Mathematical methods (2nd edition), Narosa Publishing House.

References
1. H Anton, Bivens and Davis, Calculus, 10th edition , Willey
2. E. Kreyszig, Advanced Engineering Mathematics (10th edition), Willey

3. S. S. Sastry, Introduction to Numerical Methods (5th edition), Prentice Hall of India.
4. V.N. Vedamurthy and N.Ch.S.N. Iyengar, Numerical Methods, Vikas Publishing House.

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	22	**48**
II	21	
III	24	
IV	12	
Total	**79**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (11 questions x Marks 2 each = 22)

- ***Answer any 8 questions*** *(8 questions x Marks 2 each=16)*

Part C - **Essay** (7 questions x Marks 4 each = 28)

- ***Answer any 4 questions*** *(4 questions x Marks 4 each=16)*

Part D - **Long Essay** (4 questions x Marks 6 each = 24)

- ***Answer any 2 questions*** *(2 questions x Marks 6 each=12).*

CORE COURSE 2:
INTEGRAL CALCULUS AND LOGIC

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
II	2B02 MAT	4	4	3	48	12	60

COURSE OUTCOME

CO	CO Statement
CO1	Understand Hyperbolic functions
CO2	Understand Reduction formulae for trigonometric functions and evaluation of definite integrals $\int_0^{\frac{\pi}{2}} sin^n x\, dx$, $\int_0^{\frac{\pi}{2}} cos^n x\, dx$ and $\int_0^{\frac{\pi}{2}} sin^p x\, cos^q x dx$.
CO3	Understand Polar coordinates
CO4	Understand Double integrals in Cartesian and polar form.
CO5	Understand triple integrals in rectangular, cylindrical and spherical co-ordinates
CO6	Understand Substitution in multiple integrals
CO7	Understand Numerical integration: Trapezoidal rule, Simpson's 1/3rd rule
CO8	Understand Logic and methods of proofs
CO9	Understand Propositional functions, truth set and Negation of quantified statements

2B02 MAT: Integral Calculus and Logic

Unit I – Integration of hyperbolic functions, Reduction formulae

(20 hours)

Hyperbolic functions (Section 7.7 of Text 1).

Reduction formulae, Integration of $sin^n x,$ evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^n x\, dx$, Integration of $cos^n x$, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} cos^n x\, dx$, Integration of $sin^p x cos^q x,$ evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^p x\, cos^q x dx$, integration of $tan^n x$, integration of $cot^n x$, integration of $sec^n x$, integration of $cosec^n x$ (Sections 2.8, 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2 of Text 2)

Unit II – Multiple integrals **(20 hours)**

Polar coordinates (Sections 11.3 of Text 1).

Multiple integrals: Double and iterated integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular coordinates, triple integrals in cylindrical and spherical co-ordinates, substitution in multiple integrals (Sections 11.3, 15.1, 15.2, 15.3, 15.4, 15.5, 15.7, 15.8 of Text 1).

Unit III - Numerical integration **(12 hours)**

Numerical integration, Trapezoidal rule, Simpson's 1/3 rd rule (Sections 6.3, 6.3.1, 6.3.2 of Text 3).

Unit IV – Logic and proofs **(20 hours)**

Logic and proofs (Appendix A of Text 4).

Propositional functions and truth set, Negation of quantified statements (Section 10.11, 10.12 of Text 5).

Texts

1. G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12th edition), Pearson Education
2. S. Narayan and P.K. Mittal, Integral Calculus, S. Chand
3. S. R. K. Iyengar and R. K. Jain, Mathematical methods (2nd edition), Narosa Publishing House
4. R.G. Bartle and D.R. Sherbert, Introduction to Real Analysis (4th edition), Wiley
5. S. Lipschutz, Set Theory and Related Topics (2nd edition), Schaum's Series.

References:

1. S.S. Sastry, Introductory Methods of Numerical Analysis (5th edition), PHI.
2. F.B. Hidebrand, Introduction to Numerical Analysis, TMH.
3. E. Kreyzig, Advanced Engineering Mathematics (10th Edition), Wiley
4. V.N. Vedamurthy and N.Ch.S.N. Iyengar, Numerical Methods, Vikas Publishing House.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	19	**48**
II	22	
III	14	
IV	24	
Total	**79**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (11 questions x Marks 2 each = 22)

- ***Answer any 8 questions*** *(8 questions x Marks 2 each=16)*

Part C - **Essay** (7 questions x Marks 4 each = 28)

- ***Answer any 4 questions*** *(4 questions x Marks 4 each=16)*

Part D - **Long Essay** (4 questions x Marks 6 each = 24)

- ***Answer any 2 questions*** *(2 questions x Marks 6 each=12).*

CORE COURSE 3:
ANALYTIC GEOMETRY AND APPLICATIONS OF DERIVATIVES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
III	3B03 MAT	5	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand cartesian equation of conics, eccentricity, polar equations for a conic, lines, circles
CO2	Understand Tangnts, Normals and Asymptotes
CO3	Understand Curvature, Radius of curvature ,Centre of Curvature, Circle of curvature and Evolutes of Cartesian and polar curves,
CO 4	Understand Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem and Taylors Theorem
CO5	Understand extreme values of functions, monotonic functions, first derivative test , concavity and curve sketching
CO6	Understand Indeterminate forms

3B03MAT:
Analytic Geometry and Applications of Derivatives

Unit I: Conic Sections (25 hours)
Conic Sections: Parabola, Ellipse, Hyperbola, Conics in Polar Co ordinates: Eccentricity, polar equations for a conic, lines, circles (Sections 11.6, 11.7 of Text 1)

Unit II: Tangnts, Normals and Asymptotes (25 hours)
Tangents and normals: Equation of tangent, equation of Normal, Angle of intersection of two curves, Lengths of tangents, normal.

Polar Curves: Angle between radius vector and tangent, Length of the perpendicular from pole on the tangent.

Asymptotes.

(Sections 4.6, 4.7, 4.16 of Text 2).

Unit III: Curvature and Evolutes (15 hours)
Curvature, Radius of curvature for Cartesian and polar curves, Centre of Curvature, Circle of curvature, Evolutes (Sections 4.10, 4.11, 4.12 of Text 2).

Unit IV: Mean Value Theorems, Extreme values of functions, Curve Sketching and Indeterminate forms (25 hours)
Fundamental Theorems: Rolle’s Theorem, Lagrange’s Mean Value Theorem, Cauchy’s Mean Value Theorem, Taylors Theorem (without proof), Expansions of functions (Sections 4.3, 4.4 of Text 2)

Extreme values of functions, Monotonic functions and first derivative test, concavity and curve sketching, Indeterminate forms (Proof of L’Hospital’s rule excluded) (Sections 4.1, 4.3, 4.4, 7.5 of Text 1).

Texts

1. G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas’ Calculus (12th edition), Pearson Education
2. Higher Engineering Mathematics, B.S. Grewal (43rd edition), Khanna Publishers.

References

1. S.L. Loney, The Elements of Coordinate Geometry, Part I, A.I.T.B.S. Publishers
2. H Anton, Bivens and Davis, Calculus (10th edition), Willey
3. E. Kreyszig, Advanced Engineering Mathematics (10th edition), Willey
4. S. Narayan and P.K. Mittal, Differential calculus (Revised Edition), S. Chant & Company Ltd.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	19	**48**
II	25	
III	10	
IV	25	
Total	79	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	- ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	- ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	- ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	- ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

CORE COURSE 4:
NUMBER THEORY AND APPLICATIONS OF INTEGRALS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
IV	4B04 MAT	5	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand Division algorithm, Greatest common Divisor, Euclidean Algorithm, Diophantine equation $ax+by=c$.
CO2	Understand Primes and their distribution, fundamental theorem of arithmetic, the sieve of Eratosthenes
CO3	Understand Basic properties of congruence
CO4	Understand Picard's little theorem, Wilson's theorem and Euler's theorem
CO5	Understand Substitution and the area between curves, Arc length, Areas and length in polar co-ordinates
CO6	Understand Volumes using cross sections, volumes using cylindrical shells and areas of surfaces of revolution

4B04 MAT:
Number Theory and Applications of Integrals

Unit I - Number Theory I (22 hours)

Number theory: Division algorithm (proof omitted), Greatest common Divisor, Euclidean Algorithm, Diophantine equation $ax+by=c$, primes and their distribution, fundamental theorem of arithmetic, the sieve of Eratosthenes (Sections 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2 of Text 1).

Unit II – Number Theory II (23 hours)

Basic properties of congruence, the little theorem and pseudo primes, Wilson's theorem, Euler's theorem (Proofs of Fermat's, Wilson's and Euler's theorems excluded) (Sections 4.2, 5.2, 5.3, 7.3 of Text 1).

Unit III – Area between curves and Arc length (23hours)

Substitution and the area between curves, Arc length, Areas and length in polar co-ordinates (Sections 5.6, 6.3, 11.5 of Text 2).

Unit IV – Volumes of solids and Areas of surfaces of revolution (22 hours)

Volumes using cross sections, areas of surfaces of revolution (Sections 6.1, 6.4 of Text 2).

Texts

1. David M Burton, Elementary Number theory, 7th edition, Mc Graw Hill
2. G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12th edition), Pearson Education.

References

1. T.M. Apostol, Introduction to Analytic Number Theory, Springer
2. N. Koblitz, A Course in Number theory and Cryptography (2nd edition), Springer
3. H Anton, Bivens and Davis, Calculus (10th edition), Willey
4. S. Narayan, Integral calculus, S. Chand & Company Ltd
5. Higher Engineering Mathematics, B.S. Grewal (43rd edition), Khanna Publishers.

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	**Maximum Marks**
I	19	**48**
II	20	
III	20	
IV	20	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	• ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

CORE COURSE 5:
SET THEORY, THEORY OF EQUATIONS AND COMPLEX NUMBERS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5B05 MAT	4	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand finite and infinite sets, Countable and Uncountable sets, Cantor's theorem.
CO2	Understand Roots of equations, Relations connecting the roots and coefficients of an equation, Transformation of equations, The cubic equation, Character and position of roots of an equation.
CO3	Understand Descarte's rule of signs, De Gua's Rule, Limits to the roots of an equation, Rational roots of equations, Newton's method of divisors, Symmetric functions of roots of an equation, Symmetric functions involving only the difference of the roots of f(x)=0, Equations whose roots are symmetric functions of α,β,γ.
CO4	Understand Reciprocal equations.
CO5	Understand Cubic equation, Equation whose roots are the squares of the difference of the roots, Character of the Roots, Cardan's Solution
CO6	Understand Roots of complex numbers, General form of De Moivre's theorem, the n^{th} roots of unity, the n^{th} roots of -1, Factors of x^n-1 and x^n+1, the imaginary cube roots of unity.
CO7	Understand polar form of complex numbers, powers and roots.

5B05 MAT:
Set Theory, Theory of Equations and Complex Numbers

Unit I - Finite and Infinite Sets (14 hours)

Finite and infinite sets, Countable sets, Uncountable sets, Cantor's theorem (Section 1.3 of Text 1).

Unit II - Theory of equations I (20 hours)

Roots of equations, Relations connecting the roots and coefficients of an equation, Transformation of equations, Special cases, The cubic equation, Character and position of roots of an equation, Some general theorems, Descarte's rule of signs, Corollaries, De Gua's Rule, Limits to the roots of an equation, To find the rational roots of an equation, Newton's method of divisors, Symmetric functions of roots of an equation, Symmetric functions involving only the difference of the roots of $f(x) = 0$, Equations whose roots are symmetric functions of α, β, γ (Sections 1 to 17 in chapter VI of Text 2).

Unit III - Theory of equations II (20 hours)

Reciprocal equation (Proof of theorems excluded) (Section 1 in chapter XI of Text 2)

The Cubic equation, Equation whose roots are the squares of the difference of the roots, Character of the Roots, Cardan's Solution (Section 5 of chapter VI and sections 1 to 4 of chapter XI I in Text 2).

Unit IV – Complex numbers (18 hours)

Quick review of a complex number, equality of complex numbers, fundamental operations, zero product, geometrical representation of complex numbers, addition and subtraction, product and quotients, conjugate numbers (Sections 1 to14 in chapter V of Text 2) [*Questions should not be included in the End Semester Examination from these topics for Quick review*].

Roots of complex numbers, General form of De Moivre's theorem, the n^{th} roots of unity, the n^{th} roots of -1, Factors of $x^n - 1$ and $x^n + 1$, the imaginary cube roots of unity (Sections 15 to 20 of chapter V of Text 2).

Polar form of complex numbers, powers and roots (Section 13.2 of Text 3).

Texts

1. R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis (4th edition), Wiley
2. Bernard and Child, Higher Algebra, A.I.T.B.S. Publishers
3. E. Kreyszig, Advanced Engineering Mathematics (10th edition), Wiley.

References

1. S.S. Sastry, Engineering Mathematics, Vol 1 (4th edition), PHI
2. H.S. Hall and S.R. Knight, Higher Algebra, A.I.T.B.S. Publishers
3. B.S. Grewal, Higher Engineering Mthematics (43rd edition), Khanna Publishers.

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	13	**48**
II	24	
III	22	
IV	20	
Total	**79**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)
- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (11 questions x Marks 2 each = 22)
- ***Answer any 8 questions*** *(8 questions x Marks 2 each=16)*

Part C - **Essay** (7 questions x Marks 4 each = 28)
- ***Answer any 4 questions*** *(4 questions x Marks 4 each=16)*

Part D - **Long Essay** (4 questions x Marks 6 each = 24)
- ***Answer any 2 questions*** *(2 questions x Marks 6 each=12).*

CORE COURSE 6:
REAL ANALYSIS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5B06 MAT	5	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand Algebraic Properties, Order Properties and Absolute values of ℝ. Understand the Completeness Property of ℝ and its applications to derive Archimedean Property and Density theorem.
CO2	Understand intervals in the real line.
CO3	Understand Sequences and their Limits, Limit Theorems, Monotone Sequences.
CO4	Understand Subsequences and the Bolzano-Weierstrass Theorem, The Cauchy Criterion.
CO5	Understand Infinite Series, Absolute Convergence.
CO6	Understand Comparison test, Root test, Ratio test, Integral test and Raabe’s test for Absolute convergence.
CO7	Understand Alternating series test, Dirichlet’s test and Abel’s test for Non Absolute convergence.
CO8	Understand Continuous Functions, composition of continuous functions and continuous functions on intervals.

5B06 MAT: Real Analysis I

Unit I - The Real Numbers **(20 hours)**
Algebraic and Order Properties of $\mathbb{R}$, Absolute Value and Real Line, The Completeness Property of $\mathbb{R}$, Applications of the Supremum Property, Intervals (Sections 2.1, 2.2, 2.3, 2.4, 2.5 of the Text).

Unit II – Sequences **(30 hours)**
Sequences and their Limits, Limit Theorems, Monotone Sequences, Subsequences and the Bolzano-Weierstrass Theorem, The Cauchy Criterion (Sections 3.1, 3.2, 3.3, 3.4, 3.5 of the Text).

Unit III - Series **(20 hours)**
Introduction to Infinite Series, Absolute Convergence, Tests for Absolute Convergence, Tests for Non Absolute Convergence (Sections 3.7, 9.1, 9.2, 9.3 of the Text).

Unit IV - Continuous Functions **(20 hours)**
Continuous Functions, Combination of Continuous Functions, Continuous Functions on Intervals (Sections 5.1, 5.2, 5.3 of the Text).

Text

R.G. Bartle and D.R. Sherbert, Introduction to Real Analysis (4th edition), Wiley.

References

1. T.M. Apostol, Mathematical Analysis (2nd edition), Addison-Wesley
2. W. Rudin, Principles of Mathematical Analysi (3rd edition), McGraw-Hill
3. H.L. Royden, Real Analysis (3rd edition), PHI
4. R.R. Goldberg, Methods of Real Analysis, Oxford & IBH Publishing Company
5. D. Chatterjee, Real Analysis, PHI.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	18	**48**
II	25	
III	20	
IV	16	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	• ***Answer any 2 questions***	*(2 questions x Marks 6 each=12)*

CORE COURSE 7:
ABSTRACT ALGEBRA

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5B07 MAT	5	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand definition and elementary properties of Groups, Subgroups and Cyclic groups
CO2	Understand Groups of Permutations, orbits, Alternating groups and theorem of Lagrange
CO3	Understand group homomorphisms , factor Groups
CO4	Understand Fundamental Homomorphism Theorems
CO5	Understand definition and properties of rings and fields
CO6	Understand Ring homomorphisms and isomorphisms
CO7	Understand zero divisors , integral domains , characteristic of a ring and their properties

5B07 MAT: Abstract Algebra

Unit I **(27 hours)**

Groups and Subgroups - Binary Operations, Groups, Subgroups, Cyclic Groups (Sections 2, 4, 5, 6 of the Text).

Unit II **(28 hours)**

Groups of Permutations, Orbits, Cycles and the Alternating Groups, Cosets and Theorem of Lagrange (Sections 8, 9, 10 of the Text).(Proof of Theorem 9.15 omitted).

Unit III **(20 hours)**

Homomorphisms, Factor Groups (Sections 13, 14 of the Text).

Unit IV **(15 hours)**

Rings and Fields, Integral Domains (Sections 18, 19 of the Text).
(*Problems involving direct products are omitted from all sections*)

Text

J.B. Fraleigh, A First Course in Abstract Algebra (7th edition), Pearson.

References

1. I.N. Herstein, Topics in Algebra (2nd edition), Wiley
2. M. Artin, Algebra, Prentice Hall
3. D. Chaterjee, Abstract Algebra (2nd edition), PHI
4. J.A. Gallian, Contemporary Abstract Algebra, Narosa
5. P.B. Bhatacharya, S.K. Jain and S.R. Nagpaul, Basic Abstract Algebra (2nd edition), Cambridge University Press.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	27	**48**
II	26	
III	16	
IV	10	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	• ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

CORE COURSE 8:
DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5B08 MAT	4	3	3	48	12	60

COURSE OUTCOMES

CO1	Understand Separable ODEs, Exact ODEs, Linear ODEs, Bernoulli equation and methods to solve these ODEs
CO2	Understand the theorem of Existence and Uniqueness of solutions of first and second order ODEs
CO3	Understand Homogeneous Linear ODEs of Second Order and solve homogeneous linear ODEs of second order with constant coefficients and Euler-Cauchy equation
CO4	Understand Nonhomogeneous ODEs and solve by variation of parameters
CO5	Understand Laplace Transform and inverse Laplace Transformation
CO6	Understand The first and The second shifting theorems and their applications
CO7	Understand the methods to find Laplace transforms of derivatives and integrals of functions
CO8	Understand the method of differentiating and integrating Laplace transform
CO9	Solve ordinary differential equations and integral equations using Laplace transform

5B08 MAT:
Differential Equations and Laplace Transforms

Unit I - First Order ODEs (25Hours)

First Order ODEs: Basic concepts (Modelling excluded), Separable ODEs(Modelling excluded), Exact ODEs. Integrating factors, Linear ODEs, Bernoulli equation (except Population Dynamics), Orthogonal Trajectories, Existence and uniqueness of solutions (Sections 1.1, 1.3, 1.4, 1.5, 1.6, 1.7 in Chapter 1of the Text).

Unit II – Second-Order Linear ODEs (22 Hours)

Second-Order Linear ODEs: Homogeneous Linear ODEs of Second Order, Homogeneous Linear ODEs with Constant Coefficients, Differential Operators, Euler-Cauchy Equations, Statement of Existence and Uniqueness theorem for initial value problems, linear independence of solutions, Wronskian, general solution, Nonhomogeneous ODEs, Method of undetermined coefficients, Solution by Variation of Parameters (Sections 2.1, 2.2, 2.3, 2.5, 2.6, 2.7, 2.10 in Chapter 2 of the Text).

Unit III - Laplace Transforms (25 hours)

Laplace Transform, Inverse Transform, Linearity. s-Shifting, Transforms of Derivatives and Integrals. ODEs, Unit Step Function. t-Shifting, Short Impulses, Dirac's Delta Function, Partial Fractions, Convolution, Integral Equations, Differentiation and Integration of Transforms (Sections 6.1 to 6.6 in Chapter 6 of the Text).

Texts

E. Kreyzig, Advanced Engineering Mathematics, 10th Edition, John Wiley

References

1. S.L. Ross, Differential Equations, 3rd Edition, Wiley.
2. G. Birkhoff and G.C. Rota, Ordinary Differential Equations, 3rd Edition, Wiley and Sons
3. E.A. Coddington, An Introduction to Ordinary Differential Equtions, Printice Hall
4. W.E. Boyce and R.C. Diprima, Elementary Differential Equations and Boundary Value Problems, 9th Edition, Wiley.

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	30	**48**
II	28	
III	21	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	- ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	- ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	- ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	- ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

CORE COURSE 9:
VECTOR CALCULUS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5B09 MAT	5	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand lines and planes in space
CO2	Understand curves in space, their tangents, normal, curvature, tangential and normal curvature of acceleration
CO3	Understand Directional derivatives and gradient vectors, tangent planes and differentials. Solve extreme value problems using Lagrange multipliers
CO4	Understand Partial derivatives with constrained variables and Taylor's formula for two variables
CO5	Understand Line integrals. Solve for work, circulation and flux using line integrals
CO6	Understand path independence conservative fields and potential functions
CO7	Understand Green's theorem and solve problems using Green's theorem
CO8	Understand Surface area and surface integrals
CO9	Understand Stoke's theorem and solve problems using Stoke's theorem
CO10	Understand Divergence theorem and solve problems using Divergence theorem

5B09 MAT: Vector Calculus

Unit I – Geometry of space and motion in space (25 Hours)

Lines and planes in space, curves in space and their tangents, arc length in space, curvature and normal vector of a curve, tangential and normal components of acceleration (Sections 12.5, 13.1, 13.3, 13.4, 13.5 of the Text).

Unit II - Partial derivatives (25 Hours)

Directional derivatives and gradient vectors, Tangent planes and differentials, Extreme values and saddle points, Lagrange multipliers, Partial derivatives with constrained variables, Taylor's formula for two variables (Sections 14.5, 14.6, 14.7, 14.8, 14.10 of the Text).

Unit III – Integration in vector fields I (20 Hours)

Line integrals, Vector fields and line integrals: work, circulation, flux, Path independence, conservative fields and potential functions, Green's theorem in the plane (Sections 16.1, 16.2, 16.3, 16.4 of the Text).

Unit IV - Integration in vector fields II (20 Hours)

Surfaces and area, surface integrals, Stokes' theorem (theorem without proof) (paddle wheel interpretation of $\nabla\times\mathbf{F}$ is excluded), the Divergence Theorem (theorem without proof) (Gauss' law: one of the four great laws of Electromagnetic Theory, continuity equation of hydrodynamics, unifying the integral theorems are excluded) (Sections 16.5, 16.6, 16.7, 16.8 of the Text).

Text

G.B, Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12th edition), Pearson Education

References

1. E. Kreyzig, Advanced Engineering Mathematics (10th Edition), Wiley
2. H. F. Davis and A. D. Snider, Introduction to Vector Analysis (6th Edition), Universal Book Stall, New Delhi.
3. F. W. Bedford and T. D. Dwivedi, Vector Calculus, McGraw Hill Book Company
4. S.S. Sastry, Engineering Mathematics , Vol 2 (4th edition), PHI
5. B.S. Grewal, Higher Engineering Mathematics (43rd edition), Khanna Publishers.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	22	**48**
II	25	
III	18	
IV	14	
Total	**79**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (11 questions x Marks 2 each = 22)

- ***Answer any 8 questions*** *(8 questions x Marks 2 each=16)*

Part C - **Essay** (7 questions x Marks 4 each = 28)

- ***Answer any 4 questions*** *(4 questions x Marks 4 each=16)*

Part D - **Long Essay** (4 questions x Marks 6 each = 24)

- ***Answer any 2 questions*** *(2 questions x Marks 6 each=12).*

CORE COURSE 10:
REAL ANALYSIS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	6B10 MAT	5	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand Uniform Continuity, Monotone and Inverse Functions
CO2	Understand Riemann Integral and Riemann-integrable Functions
CO3	Understand Fundamental Theorem of Calculus
CO4	Understand Improper Integrals
CO5	Understand Beta and Gamma Functions and their properties.
CO6	Understand Transformations of Gamma Function and Duplication formula
CO7	Understand Pointwise and Uniform Convergence of sequence of functions and Interchange of Limits
CO8	Understand Series of Functions
CO9	Understand the concept of Metric Spaces

6B10 MAT: Real Analysis II

Unit I – Uniform continuity and Monotone functions (20 hours)
Uniform Continuity, Monotone and Inverse Functions (Sections 5.4, 5.6 of Text 1).

Unit II – Riemann Integral (25 hours)
Riemann Integral, Riemann Integrable functions (proof of Additivity theorem is excluded), The Fundamental Theorem of Calculus (Lebesgue's Integrability Criterion and proof of Composition Theorem are excluded) (Sections 7.1,7.2, 7.3 of Text 1).

Unit III - Improper Integrals and Beta and Gamma Functions (25 hours)
Improper Integrals (Section 8.7 of Text 2).

Beta and Gamma Functions – Definitions, Properties of Beta and Gamma Functions, Transformations of Gamma Function, Some Important Deductions, Duplication formula (Sections 7.1, 7.2, 7.3, 7.4, 7.5 of Text 3).

Unit IV – Sequence and Series of Functions and Metric spaces (20 hours)
Pointwise and Uniform Convergence, Interchange of Limits, Series of Functions (Sections 8.1, 8.2, 9.4 of Text 1).

Metric Spaces – Definition, examples, neighbourhood of a point (Relevant topics from section 11.4 of the Text).

Texts

1. R.G. Bartle and D.R. Sherbert, Introduction to Real Analysis (4th edition), Wiley
2. G.B. Thomas Jr., M.D. Weir and J.R. Hass, Thomas' Calculus (12th edition), Pearson Education
3. S. Narayan and P.K. Mittal, Integral Calculus (11th edition), S. Chand Publishers.

References

1. T.M. Apostol, Mathematical Analysis (2nd edition), Addison-Wesley
2. W. Rudin, Principles of Mathematical Analysi (3rd edition), McGraw-Hill
3. H.L. Royden, Real Analysis (3rd edition), PHI
4. B.S. Grewal, Higher Engineering Mthematics (43rd edition), Khanna Publishers
5. S.S. Sastry, Engineering Mathematics, Vol 2 (4th edition), PHI
6. D. Chatterjee, Real Analysis, PHI.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	15	**48**
II	22	
III	24	
IV	18	
Total	**79**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (11 questions x Marks 2 each = 22)

- ***Answer any 8 questions*** *(8 questions x Marks 2 each=16)*

Part C - **Essay** (7 questions x Marks 4 each = 28)

- ***Answer any 4 questions*** *(4 questions x Marks 4 each=16)*

Part D - **Long Essay** (4 questions x Marks 6 each = 24)

- ***Answer any 2 questions*** *(2 questions x Marks 6 each=12).*

CORE COURSE 11:
6B11 MAT: COMPLEX ANALYSIS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	**6B11 MAT**	**5**	**4**	**3**	**48**	**12**	**60**

COURSE OUTCOMES

CO1	Understand Analytic Function, Cauchy–Riemann Equations. Laplace's Equation.
CO2	Understand Exponential Function, Trigonometric Functions, Hyperbolic Functions, Logarithmic functions and General Power of complex numbers
CO3	Understand line integral in the complex plane ,Cauchy's integral theorem , Cauchy's integral formula and derivatives of analytic functions
CO4	Understand convergence of Sequences and Series of complex functions
CO5	Understand power series, functions given by power series, Taylor series, Maclaurin's Series and Laurent Series
CO6	Understand singularities and zeros of complex functions
CO7	Understand residue integration method and integrate real integrals

6B11 MAT: Complex Analysis

Unit I – Complex Functions and Analyticity (24 hours)
Complex Functions, Limit, Continuity, Derivative, Analytic Function, Cauchy–Riemann Equations, Laplace's Equation, Exponential Function, Trigonometric and Hyperbolic Functions, Euler's Formula, Logarithm, General Power, Principal Value (Sections 13.3, 13.4, 13.5, 13.6, 13.7 of the Text).

Unit II – Complex Integration (24 hours)
Line Integral in the Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula, Derivatives of Analytic Functions (Sections 14.1, 14.2, 14.3, 14.4 of the Text).

Unit III – Power Series, Taylor Series (20 hours)
Sequences, Series, Convergence, Power Series, Functions given by Power Series, Taylor and Maclaurin's Series (Proof of Taylor's theorem excluded) (Sections 15.1, 15.2, 15.3, 15.4 of the Text).

Unit IV - Laurent Series, Residue Integration (22 hours)
Laurent Series (Proof of Laurent's Theorem excluded), Singularities and Zeros, Infinity, Residue Integration Method (Sections 16.1, 16.2, 16.3 of the Text).

Text

E. Kreyzig, Advanced Engineering Mathematics, 10th Edition, John Wiley.

References

1. J.W. Brown and R.V. Churchil, Complex Variables and Applications (7th edition), McGraw-Hill
2. S.S. Sastry, Engineering Mathematics, Vol 2 (4th edition), PHI
3. W. Rudin, Real and Complex Analysis (3rd edition), Tata McGraw-Hill
4. L.V. Ahlfors, Complex Analysis (3rd edition), McGraw-Hill
5. J.B. Conway, Functions of One Complex Varible (2nd edition), Springer
6. S. Ponnusamy, Foundations of Complex Analysis (2nd edition), Narosa.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	21	**48**
II	20	
III	18	
IV	20	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	Essay	(7 questions x Marks 4 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	• ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

CORE COURSE 12:
NUMERICAL METHODS, FOURIER SERIES AND PARTIAL DIFFERENTIAL EQUATIONS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	6B12 MAT	5	4	3	48	12	60

COURSE OUTCOMES

CO1	Understand Interpolation techniques: Interpolation with unevenly spaced points, Langrange interpolation, Newton's divided differences interpolation, Finite difference operators and finite differences, Newton's interpolation formulae and Central difference interpolation.
CO2	Understand Numerical differentiation using difference formulae
CO3	Understand Picard's method, Solution by Taylor series method, Euler method and Runge- Kutta methods.
CO4	Understand Fourier Series: Arbitrary period, Even and Odd Functions, Half-Range Expansions and Fourier Integrals.
CO5	Understand Partial Differential eqations, Solution by Separating Variables.
CO6	Understand the use of Fourier Series in solving PDE: D’Alembert’s Solution of the Wave Equation. Characteristics and solving Heat Equation by Fourier Series.
CO7	Understand Laplacian in Polar Coordinates

6B12 MAT:
Numerical Methods, Fourier series and Partial Differential Equations

Unit I- Interpolation (25 Hours)

Interpolation with unevenly spaced points, Langrange interpolation, Newton's divided differences interpolation, Finite difference operators and finite differences, Newton's interpolation formulae, Central difference interpolation. (Sections 4.2, 4.2.1, 4.2.3, 4.3.1, 4.3.2, 4.3.3 of Text 1).

Unit II - Numerical Solution of Differential Equations (25 Hours)

Introduction, Picard's method, Solution by Taylor series method, Euler method, Runge-Kutta methods (Sections 7.1, 7.2, 7.3, 7.4, 7.5 of Text 1).

Unit III - Fourier Series (20 Hours)

Fourier Series, Arbitrary period, Even and Odd Functions, Half-Range Expansions, Fourier Integrals (Sections 11.1, 11.2, 11.7 of Text 2).

Unit IV – Partial Differential Equations (20 Hours)

Basic Concepts, Solution by Separating Variables. Use of Fourier Series, D'Alembert's Solution of the Wave Equation. Characteristics, Heat Equation: Solution by Fourier Series (Steady two-dimensional Heat problems, Laplace's equation, unifying power of methods, Electro statistics and Elasticity are excluded), Laplacian in Polar Coordinates (circular membrane, Bessel's equation are excluded). (Sections 12.1, 12.3, 12.4, 12.6, 12.10 of Text 2).

Texts

1. S. R. K. Iyengar and R. K. Jain, Mathematical methods, Narosa Publishing House
2. E. Kreyzig, Advanced Engineering Mathematics (10th edition), John Wiley.

References

1. V.N. Vedamurthy and N.Ch.S.N. Iyengar, Numerical Methods, Vikas Publishing House
2. S.S. Sastry, Introductory Methods of Numerical Analysis (5th edition), PHI
3. B.S. Grewal, Higher Engineering Mathematics (43rd edition), Khanna Publishers
4. S.S. Sastry, Engineering Mathematics , Vol 2 (4th edition), PHI

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	24	**48**
II	24	
III	16	
IV	15	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	- ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	- ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	- ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	- ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

CORE COURSE 13:
LINEAR ALGEBRA

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	**6B13 MAT**	**5**	**4**	**3**	**48**	**12**	**60**

COURSE OUTCOMES

CO1	Understand the concept of Vector spaces, subspaces, linear combinations ad system of equations.
CO2	Understand the concept of Linear Dependence and Linear Independence, Bases and Dimension, Maximal Linearly Independent Subsets and solves problems.
CO3	Understand the concept of Linear Transformations, Null Spaces, and Ranges, The Matrix Representation of a Linear Transformation.
CO4	Understand Rank of a matrix, Elementary transformations of a matrix, Invariance of rank through elementary transformations, Normal form, Elementary matrices.
CO5	Understand the concept System of linear homogeneous equations Null space and nullity of matrix, Range of a matrix, Systems of linear non homogeneous equations.
CO6	Understand Eigen values, Eigen vectors, Properties of Eigen values, Cayley-Hamilton theorem.

6B13 MAT: Linear Algebra

Unit I – Vector Spaces **(20 Hours)**

Introduction, Vector spaces, Subspaces, Linear Combinations and Systems of Linear Equations (Sections 1.1, 1.2, 1.3 of Text 1).

Unit II – Bases and Dimension **(20 Hours)**

Linear Dependence and Linear Independence, Bases and Dimension, Maximal Linearly Independent Subsets (Sections 1.5, 1.6, 1.7 of Text 1).

Unit III - Linear Transformations, Matrices **(25 Hours)**

Linear Transformations, Null Spaces, and Ranges (Proof of Theorem 2.3 excluded), The Matrix Representation of a Linear Transformation (Sections 2.1, 2.2 of Text 1) (Operations of Linear Transformations and related theorems are excluded).

Introduction, Rank of a matrix, Elementary transformations of a matrix, Invariance of rank through elementary transformations, Elementary transformations of a matrix do not alter its rank, Multiplication of the elements of a row by a non zero number does not alter the rank, Addition to the elements of a row the products by a number of the corresponding elements of a row does not alter the rank, Reduction to normal form (Proof of theorem excluded), Elementary Matrices, Elementary Transformations and elementary matrices,
Employment of only row (column) transformations, The rank of a product, A Convenient method for computing the inverse of a non singular matrix by elementary row transformations (Sections 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13 of Text 2).

Unit IV - System of linear equations, Eigen values and Eigen vectors **(25 Hours)**

Introduction, System of linear homogeneous equations, Null space and nullity of matrix, Sylvester's law of nullity, Range of a matrix, Systems of linear non homogeneous equations (Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.6 of Text 2)

Eigen values, eigen vectors, Properties of eigen values, Cayley-Hamilton theorem(without proof). (Sections 2.13, 2.14, 2.15 of Text 3)

Texts

1. S.H. Friedberg, A. J. Insel and L.E. Spence, Linear Algebra (4th edition), PH Inc
2. S. Narayan and Mittal, A Text Book of Matrices (Revised edition), S. Chand

3. B.S. Grewal, Higher Engineering Mathematics (41st edition), Khanna Publishers.

References

1. R. Larson and D.C. Falvo, Elementary Linear Algebra (6th edition), Houghton Mifflin Harcourt Publishing Company
2. J.R. Kirkwood and B.H. Kirkwood, Elementary Linear Algebra, CRC Press
3. S. Kumaresan, Linear Algebra – A Geometrical approach, Prentice Hall of India
4. S. Axler, Linear Algebra Done Right (3rd edition), Springer
5. K. Hoffman and R. Kunze, Linear Algebra (2nd edition), PHI.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	18	**48**
II	17	
III	22	
IV	22	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	• ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

DISCIPLINE SPECIFIC ELECTIVE COURSES

Discipline specific elective courses are:

1. **6B14A MAT: GRAPH THEORY**
2. **6B14B MAT: OPERATIONS RESEARCH**
3. **6B14C MAT: CRYPTOGRAPGY**
4. **6B14D MAT: FUZZY MATHEMATICS**
5. **6B14E MAT: PROGRAMMING IN PYTHON.**

One of the above courses is to be chosen as Discipline Specific Elective Course.

DISCIPLINE SPECIFIC ELECTIVE COURSE 1:

GRAPH THEORY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	**6B14A MAT**	**5**	**3**	**3**	**48**	**12**	**60**

COURSE OUTCOMES

CO1	Understand a graph, subgraph ,different types of graphs and their properties
CO2	Understand and represent graph as matrix
CO3	Understand a path, cycle, trees, bridges and their properties
CO4	Understand cut vertices and connectivity of graphs
CO5	Understand Eulerian graphs, Hamiltonian graphs, The Chinese Postman Problem and The Travelling Salesman Problem.
CO6	Understand planar graphs, Euler's formula, The Platonic bodies and Kuratowski's Theorem
CO7	Model real world problems using the concept of graphs
CO8	Solve real world problems using the concept of graphs

6B14A MAT: Graph Theory

Unit I - An Introduction to Graphs **(20 hours)**

The Definition of a graph, Graphs as models, More definitions, Vertex Degrees, Sub graphs , Matrix representation of graphs (Theorems omitted).
(Sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.7 of the Text).

Unit II - Trees and connectivity **(25 hours)**

Paths and Cycles, Definition of trees and simple properties, Bridges, spanning trees, Cut vertices and connectivity.
(Sections 1.6, 2.1, 2.2, 2.3, 2.6 of the Text).

Unit III - Euler Tour and Hamiltonian cycles **(22 hours)**

Euler tours (Excluding Fleury's algorithm), The Chinese Postman Problem, Hamiltonian Graphs, The Travelling salesman Problem (Algorithm Omitted).
(Sections 3.1, 3.2, 3.3, 3.4 of the Text).

Unit IV - Planar Graphs **(23 hours)**

Plane and planar Graphs, Euler's formula, The platonic bodies, Kuratowski's theorem (Proof of Theorem 5.13 and 5.14 are omitted).
(Sections 5.1, 5.2, 5.3, and 5.4).

Text

J. Clark and D.A. Holton, A First Look at Graph Theory, Allied Publishers.

References

1. R. Balakrishnan and K. Ranganathan, A Text Book of Graph Theory (2nd edition), Springer.
2. J.A. Bondy and U.S.R. Murthy, Graph Theory with Aplications, Macmillan
3. F. Harary, Graph Theory, Narosa
4. K.R. Parthasarathy, Basic Graph Theory, Tata-McGraw Hill.
5. G. Chartrand and P. Zhang, Introduction to Graph Theory, Tata McGraw Hill

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	19	**48**
II	21	
III	19	
IV	20	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	Essay	(7 questions x Marks 4 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	• ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

DISCIPLINE SPECIFIC ELECTIVE COURSE 2:
6B14B MAT: OPERATIONS RESEARCH

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	**6B14B MAT**	**5**	**3**	**3**	**48**	**12**	**60**

COURSE OUTCOMES

CO1	Understand convex sets, convex functions, their properties, local and global extrema and quadratic forms
CO2	Understand LPP, formulate and solve using graphical method
CO3	Understand General LPP, canonical and standard forms of LPP
CO4	Understand simplex method and solve LPP
CO5	Understand basic solution, degenerate solution, basic feasible solution, optimum basic feasible solution , fundamental properties of solution and simplex method
CO6	Understand primal-dual pair, formulation of dual and duality theorems
CO7	Understand LP formulation of transportation problem and its solution
CO8	Understand Mathematical formulation of Assignment problem and Hungarian Assignment method
CO9	Understand problem of sequencing , Processing ‘n’ jobs through ‘2’ machines, Processing ‘n’ jobs through ‘k’ machines
CO10	Understand basic terms in Game theory, The Maximin-Minimax Principle, Solution of game with saddle point, Solution of 2x2 game without saddle point, Graphic solution of 2xn and mx2 games and Arithmetic method for nxn Games.

6B14B MAT: Operations Research

Unit I - Linear Programming Problem (30 hours)

Convex sets and their properties, Convex Functions, Local and Global Extrema, Quadratic Forms.

Linear Programming Problem – Mathematical formulation, Graphical solution, General Linear Programming Problem , Slack and Surplus Variables, Canonical and standard form of LPP, Insights into the simplex method.

Basic Solution, Degenerate Solution, Basic Feasible Solution, Associated cost vector, Improved basic Feasible solution, Optimum Basic Feasible Solution, Fundamental Properties of solution (Proof of theorems omitted), Simplex method – The computational Procedure, The Simplex Algorithm.

General Primal-Dual Pair, Formulating a dual problem (Sections 0:13, 0:15, 0:16, 0:17, 2:1, 2:2, 2:3, 2:4, 3:1, 3:2, 3:4, 3:5, 3:6, 4:1, 4:2, 4:3, 5:1, 5:2, 5:3of the Text).

Unit II - Transportation Problem (25 hours)

LP formulation of the Transportation Problem, Existence of solution in T.P, Duality in Transportation problem, The Transportation Table, Loops in Trasportation Tables, Triangular basis in a T.P (proof of theorem Omitted), Solution of a Trasportation problem, North-west corner Method, Least –Cost Method, VAM, Test For Optimality, Degeneracy in TP, MODI Method.

(Sections 10:1,10:2,10:3,10:4,10:5,10:6,10:7,10:8,10:9,10:10,10:12,10:13 of the Text)

Unit III - Assignment Problem and Sequencing Problem (20 hours)

Assignment Problem: Mathematical Formulation of Assignment Problem, Hugarian Assignment Method.

Sequencing Problem: Problem of sequencing, Basic terms used in sequencing, Processing ‘n’ jobs through ‘2’ machines, Processing ‘n’ jobs through ‘k’ machines, Maintenance Crew Scheduling.

(Sections 11:1, 11:2, 11:3, 12:1, 12:2, 12:3, 12:4, 12:5, 12:7 of the Text)

Unit IV - Games and Strategies (15 hours)

Two-person Zero-sum Games, Basic terms in Game theory, The Maximin-Minimax Principle, Solution of game with saddle point, Solution of 2x2 game without saddle point, Graphic solution of 2xn and mx2 games, Dominance Property, Modified Dominance Property, Arithmetic Method for nxn Games. (Proofs of all theorems in this unit are omitted).

(Sections 17:1, 17:2, 17:3, 17:4, 17:5, 17:6, 17:7, 17:8 of the Text)

Text

K. Swarup, P.K.Gupta and M. Mohan, Operations Research (18th edition), Sulthan Chand and Sons.

References

1. J.K. Sharma, Operations Research - Theory and Applications, McMillan
2. H.A. Thaha, Operations Research, An Introduction (8th edition), Prentice Hall
3. G. Hadley, Linear Programming, Oxford & IBH Publishing Company.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	25	**48**
II	22	
III	18	
IV	14	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	- ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	- ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	Essay	(7 questions x Marks 4 each = 28)
	- ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	- ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

DISCIPLINE SPECIFIC ELECTIVE COURSE 3:
CRYPTOGRAPHY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	**6B14C MAT**	**5**	**3**	**3**	**48**	**12**	**60**

COURSE OUTCOMES

CO1	Understand Simple Cryptosystems namely, The Shift Cipher, The Substitution Cipher, The Affine Cipher, The Vigenere Cipher, The Hill Cipher, The Permutation Cipher and Stream Ciphers
CO2	Understand basics of Shannon's Theory, Elementary Probability Theory, Perfect Secrecy, Entropy, Huffman Encodings and Entropy, Properties of Entropy, Spurious Keys and unicity Distance, Product Cryptosystems.
CO3	Understand The Euclidean Algorithm, The Chinese Remainder Theorem
CO4	Understand Legendre and Jacobi Symbols and quadratic residues
CO5	Understand The RSA System and Factoring (25 Hours): Introduction to Public-key Cryptography, The RSA Cryptosystem, Implementing RSA, Primality Testing, The Solovay-Strassen Algorithm, The Miller Rabin Algorithm, Square roots modulo *n*.

6B14C MAT: Cryptography

Unit I - Some Simple Cryptosystems (20 Hours)

Introduction, The Shift Cipher, The Substitution Cipher, The Affine Cipher, The Vigenere Cipher, The Hill Cipher, The Permutation Cipher, Stream Ciphers (Section 1.1 of Chapter 1 in the Text).

Unit II - Shannon's Theory (25 Hours)

Introduction, Elementary Probability Theory, Perfect Secrecy, Entropy, Huffman Encodings and Entropy, Properties of Entropy, Spurious Keys and Unicity Distance, Product Cryptosystems (Chapter 2 in the Text).

Unit III - More on Number Theory (20 Hours)

The Euclidean Algorithm, The Chinese Remainder Theorem, Other Useful Facts (Proof of Lagrange's theorem omitted), Legendre and Jacobi Symbols (Sections 5.2 and 5.4.1 of Chapter 5 in the Text).

Unit IV - The RSA System and Factoring (25 Hours)

Introduction to Public-key Cryptography, The RSA Cryptosystem, Implementing RSA, Primality Testing, The Solovay-Strassen Algorithm, The Miller Rabin Algorithm, Square roots modulo n (Sections 5.1, 5.3, 5.4.2, 5.4.3, 5.5 of Chapter 5in the Text).

Text

Douglas R. Stinson, Cryptography: Theory and Practice- Third Edition, CRC Press, 2006.

References:

1. David M. Burton, Elementary Number Theory- Seventh Edition, Mc Graw Hill
2. William Stallings, Cryptography and Network Security Principles and Practices- Fourth Edition, Prentice Hall
3. Christof Paar-Jan Pelzl, Understanding Cryptography- A Text for Students and Practitioners, Springer.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	19	**48**
II	21	
III	19	
IV	20	
Total	**79**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	• ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

DISCIPLINE SPECIFIC ELECTIVE COURSE 4:
FUZZY MATHEMATICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	**6B14D MAT**	**5**	**3**	**3**	**48**	**12**	**60**

COURSE OUTCOMES

CO1	Understand Fuzzy Subsets, L-fuzzy Sets, Visual representation of a Fuzzy Subset, Operations on Fuzzy Subsets, Empty Fuzzy Subset 0
CO2	Understand Universal Fuzzy Subset, Disjoint Fuzzy Subsets, Disjunctive Sum
CO3	Understand α Level Set, Properties of Fuzzy Subsets of a Set, Algebraic Product and Sum of Two Fuzzy Subsets, Properties Satisfied by Addition and Product
CO4	Understand Cartesian Product of Fuzzy Subsets
CO5	Understand Fuzzy Relations, Binary Fuzzy Relations, Binary Relations on a Single Set, Fuzzy Equivalence Relations
CO6	Understand Fuzzy Subgroup, Fuzzy Subgroupoids
CO7	Understand The Lattice of Fuzzy Subgroups, Fuzzy Subgroup, Fuzzy Subrings

6B14D MAT: Fuzzy Mathematics

Unit I - Fuzzy Subsets and Fuzzy Mappings I (25 hours)

Introduction, Fuzzy Subsets, L-fuzzy Sets, Visual Representation of a Fuzzy Subset, Operations on Fuzzy Subsets, Empty Fuzzy Subset 0 and Universal Fuzzy Subset, Disjoint Fuzzy Subsets, Disjunctive Sum (Sections 1.1, 1.2, 1.5, 1.6, 1.7, 1.7.1, 1.7.2, 1.8 of Text 1).

Unit II - Fuzzy Subsets and Fuzzy Mappings II (23 hours)

α Level Set, Properties of Fuzzy Subsets of a Set, Algebraic Product and Sum of Two Fuzzy Subsets, Properties Satisfied by Addition and Product, Cartesian Product of Fuzzy Subsets (Sections 1.9, 1.10, 1.11, 1.12, 1.13 in Text 1. Proof of theorems in Section 1.13 omitted).

Unit III - Fuzzy Relations (22 hours)

Crisp and Fuzzy Relations, Binary Fuzzy Relations, Binary Relations on a Single Set, Fuzzy Equivalence Relations (Sections 5.1, 5.3, 5.4, 5.5 of Text 2).

Unit IV - Fuzzy Groups and Fuzzy Rings (20 hours)

Introduction, Fuzzy Subgroup, Fuzzy Sub groupoids, The Lattice of Fuzzy Subgroups, Fuzzy Subgroup, Fuzzy Sub rings (Section 3.1, 3.2, 3.2.1, 3.2.2, 3.3.2, 3.5 except Theorems 3.5.2, 3.5.3, 3.5.4, 3.5.5 in Text 1).

Texts

1. S. Nanda and N.R. Das, Fuzzy Mathematical Concepts, Narosa Pub. House
2. G.J. Klir and B Yuan, Fuzzy Sets and Fuzzy Logic: Theory and Applications.

References

1. K.H. Lee, First Course on Fuzzy Theory and Applications, Springer-Verlag
2. H.J. Zimmermann, Fuzzy Set Theory-And Its Applications (2nd revised edition), Allied Publishers Limited.

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	21	**48**
II	20	
III	19	
IV	19	
Total	**79**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (11 questions x Marks 2 each = 22)

- ***Answer any 8 questions*** *(8 questions x Marks 2 each=16)*

Part C - **Essay** (7 questions x Marks 4 each = 28)

- ***Answer any 4 questions*** *(4 questions x Marks 4 each=16)*

Part D - **Long Essay** (4 questions x Marks 6 each = 24)

- ***Answer any 2 questions*** *(2 questions x Marks 6 each=12).*

DISCIPLINE SPECIFIC ELECTIVE COURSE 5: PROGRAMMING IN PYTHON

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
VI	**6B14E MAT**	**5**	**3**	**3**	**48**	**12**	**60**

COURSE OUTCOMES

CO1	Understand the basics of Python Variables, Indentation in Python, Input, Output and Import Functions Operators
CO2	Understand Pythan programming for numbers, Dictionaries and Mathematical functions
CO3	Understand Flow Control, if, if..else, if ,.else, Loops – for loop, Range Function, while, Section 3.3 Nested Loop, Break and Continue Statements in Pythan
CO4	Understand Data visualization – The Matplot lib Module, Plotting mathematical functions, Famous Curves, 2D plot using colors, Mesh grids, 3D Plots using Pthan
CO5	Understand Pythan programming for Solving equations using Newton-Raphson's Method , Bisection Method , Method of false position, Trapezoidal rule of Numerical Integration , Simpson's Three Eighth rule of Numerical Integration, Euler's Modified Method to solve first order differential equation , Runge-Kutta Method of Order 4, Lagrange's Method for Interpolation.

6B14E MAT: Programming in Python

Unit I **(30 Hours)**

Features of Python, Variables, Indentation in Python, Input, Output and Import Functions, Operators, Numbers, List, Tuples, Set, Dictionaries, Mathematical Functions (Sections 1.1, 1.5, 1.7, 1.11, 1.12, 2.1, 2.3, 2.5, 2.6 of Text 1. 1.12.4 and 1.12.7 omitted).

Unit II **(18 hours)**

Flow Control, if, if..else, Loops – for loop, Range Function, while, Nested Loop, Break and Continue Statements (Section 3.1, 3.2, 3.3, 3.4 of Text 1).

UNIT III **(20 Hours)**

Data visualization – The Matplot lib Module, Plotting mathematical functions, Famous Curves, 2D plot using colors, Mesh grids, 3D Plots. (Relevant sections from Text 2).

Practicals (10 Programmes) **(22 Hours)**

1. Solution of Ax =B using Doolittle method
2. Newton-Raphson's Method
3. Bisection Method
4. Method of false position
5. Trapezoidal rule of Numerical Integration
6. Simpson's Three Eighth rule of Numerical Integration
7. Euler's Modified Method to solve first order differential equation
8. Runge-Kutta Method of Order 4
9. Lagrange's Method for Interpolation
10. Taylor Series Method for initial value problems.

Texts

1. Dr. Jeeva Jose, Taming Python by Programming, Khanna Publications
2. B.P. Ajith Kumar, Python for Education – Learning Mathematics and Physics using Python and writing them in Latex (Free download from www.iuac.res.in/phoenix).

Reference

J. Kiusalaas, Numerical methods in Engineering with Python, Cambridge University Press.

Marks including choice

Unit	**Marks in End Semester Examination***	
	Aggregate Marks	**Maximum Marks**
I	25	**48**
II	14	
III	16	
IV	24	
Total	**79**	48

**No End Semester Practical Examination shall be conducted for this course.*

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 8 questions***	*(8 questions x Marks 2 each=16)*
Part C -	**Essay**	(7 questions x Marks 4 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 4 each=16)*
Part D -	**Long Essay**	(4 questions x Marks 6 each = 24)
	• ***Answer any 2 questions***	*(2 questions x Marks 6 each=12).*

6B15 MAT: PROJECT

A student of B.Sc. Mathematics should compulsorily do a project work on a topic of his/her choice and prepare a project dissertation for completing the B.Sc. Mathematics Pogramme. The project work should satisfy the following criteria.

1. The topic of study should not be a part of the existing syllabus. But it can be an extension of a topic of the syllabus.
2. After the completion of the study, the student shall submit a project dissertation to the university in typed form.
3. The dissertation should have at least 15 pages excluding the page of table of contents.
4. The dissertation can be prepared using any typesetting software like LaTeX, MS Word or Libre Office Writer.
5. The project work can be done individually if the student so wishes. It can be done as a group having maximum 3 students.
6. The dissertation should contain a Title Page, Certificate from the Project Guide/Supervisor countersigned by the Head of the Department, Table of Contents, Preface/Introduction and References.

Evaluation of the project work and dissertation

1. **Internal Evaluation**
   Internal evaluation of the project has the following components.

Sl. No.	Components	Percentage of marks allotted	Marks allotted
1	Relevance of the topic and references	20	1.4
2	Layout	10	0.7
3	Content	20	1.4
4	Presentation and Viva-voce*	50	3.5
	Total	**100**	**7**

*Presentation and Viva-voce are to be conducted individually even if the project is done as a group.

2. **External Evaluation**

External evaluation of the project has the following components.

Sl. No.	Components	Percentage of marks	Marks allotted
1	Relevance and depth of the topic and layout	25	7
2	Seminar presentation*	25	7
3	Viva-voce*	50	14
Total		**100**	**28**

*Viva-voce and Seminar presentation are to be conducted individually even if the project is done as a group.

The student should get a minimum of 40% of the aggregate marks and 40% separately for End Semester examination and 10% for CE for pass in the project.

PART B

MATHEMATICS
COMPLEMENTARY ELECTIVE COURSES

FOR
BSc PHYSICS, CHEMISTRY, STATISTICS, ELECTRONICS, COMPUTER SCIENCE AND BCA PROGRAMMES

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

1. BSc PHYSICS PROGRAMME

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS
1C01 MAT-PH	MATHEMATICS FOR PHYSICS I	I	4	3	3
2C02 MAT-PH	MATHEMATICS FOR PHYSICS II	II	4	3	3
3C03 MAT-PH	MATHEMATICS FOR PHYSICS III	III	5	3	3
4C04 MAT-PH	MATHEMATICS FOR PHYSICS IV	IV	5	3	3

2. BSc CHEMISTRY PROGRAMME

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS
1C01 MAT-CH	MATHEMATICS FOR CHEMISTRY I	I	4	3	3
2C02 MAT-CH	MATHEMATICS FOR CHEMISTRY II	II	4	3	3
3C03 MAT-CH	MATHEMATICS FOR CHEMISTRY III	III	5	3	3
4C04 MAT-CH	MATHEMATICS FOR CHEMISTRY IV	IV	5	3	3

3. BSc STATISTICS PROGRAMME

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS
1C01 MAT-ST	MATHEMATICS FOR STATISTICS I	I	4	3	3
2C02 MAT-ST	MATHEMATICS FOR STATISTICS II	II	4	3	3
3C03 MAT-ST	MATHEMATICS FOR STATISTICS III	III	5	3	3
4C04 MAT-ST	MATHEMATICS FOR STATISTICS IV	IV	5	3	3

4. BSc ELECTRONICS PROGRAMME

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS
1C01 MAT-EL	MATHEMATICS FOR ELECTRONICS I	I	4	3	3
2C02 MAT-EL	MATHEMATICS FOR ELECTRONICS II	II	4	3	3
3C03 MAT-EL	MATHEMATICS FOR ELECTRONICS III	III	5	3	3
4C04 MAT-EL	MATHEMATICS FOR ELECTRONICS IV	IV	5	3	3

5. BSc COMPUTER SCIENCE PROGRAMME

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS
1C01 MAT-CS	MATHEMATICS FOR COMPUTER SCIENCE I	I	4	3	3
2C02 MAT-CS	MATHEMATICS FOR COMPUTER SCIENCE II	II	4	3	3
3C03 MAT-CS	MATHEMATICS FOR COMPUTER SCIENCE III	III	5	3	3
4C04 MAT-CS	MATHEMATICS FOR COMPUTER SCIENCE IV	IV	5	3	3

6. BCA PROGRAMME

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS
1C01 MAT-BCA	MATHEMATICS FOR BCA I	I	4	4	3
2C02 MAT-BCA	MATHEMATICS FOR BCA II	II	4	4	3
3C03 MAT-BCA	MATHEMATICS FOR BCA III	III	4	4	3
4C04 MAT-BCA	MATHEMATICS FOR BCA IV	IV	4	4	3

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS	REAMARKS
COMPONENT1- ASSIGNMENT / SEMINAR / VIVA-VOCE	50%	5	For each course, a student has to submit one assignment/ attend one seminar/ attend one viva-voce
COMPONENT 2- TEST PAPER	50%	5	For each course, a student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.
TOTAL	100%	**10**	

- **Use of Scientific Calculators below 100 functions (that is, upto fx 99) shall be permitted for all the above courses.**

MATHEMATICS COMPLEMENTARY ELECTIVE COURSES FOR BSc PHYSICS PROGRAMME

COMPLEMENTARY ELECTIVE COURSE 1:

MATHEMATICS FOR PHYSICS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
I	**1C01 MAT - PH**	**4**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand the concept of Differentiation and successive differentiation.
CO2	Understand Fundamental theorem – Rolle’s theorem, Lagrange’s mean-value theorem, Cauchy’s mean-value theorem,.
CO3	Understand the Taylor’s theorem , expansions of functions – Maclaurin’s series, expansion by use of known series
CO4	Understand the Matrices and System of Equations, Linear Transformations
CO5	Understand Rank of a matrix, elementary transformations, normal form of a matrix, inverse of a matrix, solution of linear system of equations.
CO6	Understand Linear transformations, orthogonal transformation, vectors – linear dependence
CO7	Understand Derivative of arc, curvature, Polar coordinates, Cylindrical and Spherical co-ordinates

1C01 MAT-PH: Mathematics for Physics I

Unit I - Differential Calculus - Differentiation and successive differentiation (18 hours)

Text: Differential Calculus, Shanti Narayan and P. K. Mittal

Quick review of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. (*Questions should not be asked in the End Semester Examinations from the above sections for quick review*) (Relevant portions from sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10).

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the nth derivative of the product of two functions (Sections 4.1, 4.2)

Unit II - Differential Calculus – Applications of differential Calculus (18 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem, Taylor's theorem (Generalised mean value theorem)(without proof), expansions of functions – Maclaurin's series, expansion by use of known series, Taylor's series, Indeterminate forms - form $0/0$, form ∞/∞, form reducible to $0/0$ form - form $0.\infty$, form $\infty-\infty$, forms $0^0, 1^\infty$, ∞^0 . (Sections 4.3, 4.4, 4.5)

Unit III - Linear Algebra – Matrices and System of Equations, Linear Transformations (20 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Rank of a matrix, elementary transformation of a matrix, equivalent matrix,s elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence
(Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)

Unit IV - Curvature and Geometry **(16 hours)**

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Derivative of arc, curvature (radius of curvature only for Cartesian curve y=f(x)), centre of curvature

(Sections 4.9, 4.10, 4.11, 4.12)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Polar coordinates, Cylindrical and spherical co-ordinates

(Section 11.3, relevant portions from section 15.7).

References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai.
2. Text of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company.
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley.
5. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	18	**40**
II	16	
III	18	
IV	14	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)
- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (11 questions x Marks 2 each = 22)
- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 28)
- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)
- ***Answer any 2 questions*** *(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 2:
MATHEMATICS FOR PHYSICS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
II	**2C02 MAT - PH**	**4**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand partial derivatives, homogeneous functions, Euler's theorem, total derivative, differentiation of implicit functions, change of variables
CO2	Understand Integration and Integration by Successive Reduction , Integration of Trigonometric Functions
CO3	Comprehend Applications of Integration
CO4	Comprehend Eigen values, Eigen vectors, properties of Eigen values,
CO5	Understand Cayley- Hamilton theorem, Diagonal form, similarity of matrices, powers of a matrix, canonical form, nature of a quadratic form

2C02 MAT-PH: Mathematics for Physics II

Unit I - Differential Calculus – Partial Differentiation (18 hours)

Text: Differential Calculus, Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

Unit II - Integral Calculus - Integration and Integration by Successive Reduction (18 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Quick review of basics of Integration (*Questions should not be asked in the End Semester Examinations from the above sections for quick review*)

(Sections 8.1, 8.2, 8.3, 8.4, 8.5)

Text: Integral Calculus, Santhi Narayanan and P.K. Mittal

Integration of Trigonometric Functions: Integration of $\sin^n x$ where n is a positive integer, Integration of $\sin^n x$, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} \sin^n x\, dx$, Integration of $\cos^n x$, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} \cos^n x\, dx$, Integration of $\sin^p x \cos^q x$, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} \sin^p x \cos^q x dx$, integration of $\tan^n x$, integration of $\cot^n x$, integration of $\sec^n x$, integration of $\operatorname{cosec}^n x$

(Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2)

Unit III - Integral Calculus – Applications of Integration (18 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Substitutions and the area between curves, volumes using cross sections, arc length, areas of surfaces of revolution, areas and length in polar coordinates

(Section 5.6, 6.1, 6.3, 6.4, 11.5)

Unit IV - Linear Algebra – Eigen Values and Cayley Hamilton Theorem (18 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices,

powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form.
(Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18).

References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai.
2. Text of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company.
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley.
5. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	16	
III	16	
IV	18	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 3:

MATHEMATICS FOR PHYSICS III

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
III	3C03 MAT - PH	5	3	3	40	10	50

COURSE OUTCOMES

CO1	Understand the concept of Multiple Integrals and solves problems
CO2	Understand Vector Differentiation
CO3	Understand Laplace Transforms and its Applications
CO4	Understand Fourier Series and Half range expansions

3C03 MAT-PH: Mathematics for Physics III

Unit I - Integral Calculus – Multiple Integrals (26 hours)
Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates, substitutions in multiple integrals
(Sections 15.1, 15.2, 15.3, 15.4, 15.5, 15.8)

Unit II - Vector Calculus – Vector Differentiation (22 hours)
Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Lines and planes in space, curves in space and their tangents, curvature and normal vector of a curve, tangential and normal components of acceleration, directional derivatives and gradient vectors.
(Sections 12.5, 13.1, 13.3 to 13.5, 14.5)

Unit III - Laplace Transforms and its Applications (24 hours)

Text: Advanced Engineering Mathematics (10^{th} edition), E. Kreyszig, Wiley.

Laplace Transforms: Laplace Transform, Linearity, first shifting theorem (*s*-Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem (*t*- Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.

(Chapter 6 Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9)(Proofs are omitted)

Unit IV - Fourier Series (18 hours)

Text: Advanced Engineering Mathematics (10^{th} edition), E. Kreyszig, Wiley.

Fourier Series Fourier series, arbitrary period, , Even and Odd functions, Half-range Expansions. (Proofs are omitted)

(Chapter 11 Sections 11.1, 11.2)

References

1. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
2. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
3. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.
4. Higher Engineering Mathematics (41^{st} edition), B.S. Grewal, Khanna Pub.

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	18	**40**
II	16	
III	18	
IV	14	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(11 questions x Marks 2 each = 22)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	Essay	(7 questions x Marks 3 each = 28)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 4:

MATHEMATICS FOR PHYSICS IV

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
IV	**4C04 MAT - PH**	**5**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Wave Equation, Solution by Separating Variables, D-Alembert’s solution of the wave equation.
CO2	Understand Heat Equation and Solution by Fourier Series
CO3	Understand Line integrals , path independence, conservative fields and potential functions, Green’s theorem in the plane
CO4	Understand Surface area, surface integrals, Stoke’s theorem, Divergence theorem
CO5	Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule
CO6	Understand Numerical Solutions of Ordinary Differential Equations by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

4C04 MAT-PH: Mathematics for Physics IV

Unit I - Partial differential Equations (20 hours)
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley.
Basic Concepts, Modeling: Vibrating String, Wave Equation,
Solution by Separating Variables, Use of Fourier Series, D-Alembert's solution of the wave equation, Heat Equation, Solution by Fourier Series.
(Chapter 12 sections 12.1, 12.2, 12.3, 12.4, 12.5, 12.6)
(*Excluding* steady two dimensional heat problems and Laplace equation of 12.5).

Unit II - Vector Calculus – Vector Integration (22 hours)
Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.
Line integrals (mass, moment and moment of inertia are excluded), vector fields and line integrals: work, circulation and flux, path independence, conservative fields and potential functions, Green's theorem in the plane (Proof of Green's theorem is excluded)
(Sections 16.1, 16.2,16.3,16.4)

Unit III - Vector Calculus – Vector Integration (24 hours)
Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.
Surfaces and area, surface integrals, Stoke's theorem, the divergence theorem and unified theory (Gauss's Law: One of the four great laws of Electromagnetic Theory, continuity equation of Hydrodynamics, Unifying the integral theorems are excluded) (Proofs of all theorems are excluded)
(Sections16.5, 16.6, 16.7, 16.8)

Unit IV - Numerical Analysis (24 hours)
Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastry PHI Learning.
Numerical Integration: Numerical Integration, Trapezoidal Rule, Simpson's 1/3- Rule
(Chapter 6 Sections 6.4, 6.4.1, 6.4.2)
Numerical Solutions of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.
(Sections 8.1, 8.2, 8.4, 8.4.2, 8.5)

References

1. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
2. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
3. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.
4. Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.
5. Mathematical methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	16	
III	16	
IV	18	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)
- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (11 questions x Marks 2 each = 22)
- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 28)
- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)
- ***Answer any 2 questions*** *(2 questions x Marks 5 each=10).*

MATHEMATICS COMPLEMENTARY ELECTIVE COURSES FOR BSc CHEMISTRY PROGRAMME

COMPLEMENTARY ELECTIVE COURSE 1:

MATHEMATICS FOR CHEMISTRY I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
I	1C01 MAT-CH	4	3	3	40	10	50

Course outcomes

CO1	Understand Successive differentiation and Leibnitz's theorem for the nth derivative of the product of two functions
CO2	Understand Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem and Cauchy's mean value theorem.
CO3	Understand Taylor's theorem, expansions of functions – Maclaurin's series, expansion by use of known series and Taylor's series.
CO4	Understand the method of finding limits of Indeterminate forms.
CO5	Understand Polar, Cylindrical and Spherical co-ordinates.
CO6	Understand Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix and partition method of finding the inverse.
CO7	Understand solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations.
CO8	Understand Linear transformations, orthogonal transformation and linear dependence of vectors.
CO9	Understand methods of curve fitting, graphical method, laws reducible to the linear law, principles of least squares, method of least squares and apply the principle of least squares to fit the straight line $y=a+bx$, to fit the parabola $y=a+bx+cx^2$, to fit $y=ax^b$, $y=ae^{bx}$ and $xy^n=b$

1C01 MAT-CH: Mathematics For Chemistry I

Unit I - Differential Calculus - Differentiation and successive differentiation (18 hrs)

Text: Differential Calculus, Shanti Narayan and P.K. Mittal

Quick review of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. *(Questions should* ***not*** *be asked in the End Semester Examinations from the above sections for quick review)* (Relevant portions from sections 4.3,4.4,4.5,4.6,4.7, 4.8,4.9,4.10)

Text: Higher Engineering Mathemaics (41st edition), B.S. Grewal, Khanna Pub.

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the nth derivative of the product of two functions (Sections 4.1, 4.2)

UnitII : Differential Calculus – Applications of Differentiation (18 hrs)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem, Taylor's theorem (Generalised mean value theorem)(without proof), expansions of functions – Maclaurin's series, expansion by use of known series, Taylor's series, Indeterminate forms - form 0/0, form ∞/∞, forms reducible to 0/0 form - form $0.\infty$, form ∞-∞, forms 0^0,1^∞, ∞^0.

Unit III Linear Algebra – Matrices and System of Equations, Linear Transformations (20 hrs)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Rank of a matrix, elementary transformation of a matrix, equivalent matrix,s elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equatios in n unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence
(Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)

Unit IV Curve Fitting **(16 hrs)**

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Introduction, graphical method, laws reducible to the linear law, principles of least squares, method of least squares, to fit the straight line y=a+bx, to fit the parabola $y=a+bx+cx^2$ (Sections 24.1, 24.2, 24.3, 24.4, 24.5)

References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Text of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
5. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
6. Fundamentals of Mathematical Statistics, S.C. Gupta and V.K. Kapoor, Sultan Chand.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	16	
III	20	
IV	14	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)
- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)
- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 21)
- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)
- ***Answer any 1 question*** *(2 questions x Marks 5each=10).*

COMPLEMENTARY ELECTIVE COURSE 2:
MATHEMATICS FOR CHEMISTRY II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
II	**2C02 MAT-CH**	**4**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Functions of two or more variables, limits and continuity.
CO2	Understand partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions and change of variables.
CO3	Understand Reduction formulae for trigonometric functions and evaluation of definite integrals $\int_0^{\frac{\pi}{2}} sin^n x\, dx$, $\int_0^{\frac{\pi}{2}} cos^n x\, dx$ and $\int_0^{\frac{\pi}{2}} sin^p x\, cos^q x dx$.
CO4	Understand Substitutions and the area between curves, arc length, areas and length in polar coordinates.
CO5	Understand Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form and triple integrals in rectangular co-ordinates.
CO6	Understand Eigen values, Eigen vectors, properties of Eigen values, Cayley- Hamilton theorem, reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form and nature of a quadratic form

2C02 MAT-CH: Mathematics for Chemistry II

Unit I - Differential Calculus – Partial Differentiation (18 hours)

Text: Differential Calculus, Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.
(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

Unit II - Integral Calculus - Integration and Integration by Successive Reduction (18 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services

Quick review of basics of Integration **(Questions should not be asked in the End Semester Examinations from the above sections for quick review)**
(Sections 8.1, 8.2, 8.3, 8.4, 8.5)

Text: Integral Calculus, Santhi Narayanan and P.K. Mittal

Integration of Trigonometric Functions: Integration of $\sin^n x$ where n is a positive integer, Integration of $sin^n x,$ evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^n x \, dx$, Integration of $cos^n x$, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} cos^n x \, dx$,Integration of $sin^p x cos^q x,$ evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^p x \, cos^q x dx$, integration of $tan^n x$, integration of $cot^n x,$ integration of $sec^n x$, integration of $cosec^n x$
(Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2)

Unit III - Integral Calculus – Applications of Integration and Multiple Integrals (20 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Substitutions and the area between curves, arc length, polar coordinates, areas of surfaces of revolution, areas and length in polar coordinates (Section 5.6, 6.3, 11.3, 11.5).

Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates (Sections 15.1, 15.2, 15.3, 15.4, 15.5).

Unit IV - Linear Algebra – Eigen Values (16 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form (Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18.)

References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Text of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
5. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	16	
III	20	
IV	14	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)
- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)
- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 21)
- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)

Answer any 2 questions *(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 3:

MATHEMATICS FOR CHEMISTRY III

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
III	3C03 MAT-CH	5	3	3	40	10	50

COURSE OUTCOMES

CO1	Understand Ordinary differential equations, Geometrical meaning of $y'=f(x, y)$ and Direction Fields.
CO2	Understand Methods of solving Differential Equations: Separable ODEs, Exact ODEs, Integrating Factors, Linear ODEs and Bernoulli Equation.
CO3	Understand Orthogonal Trajectories, Existence and Uniqueness of Solutions.
CO4	Understand Second order ODEs, Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian, Nonhomogeneous ODEs and Solution by variation of Parameters
CO5	Understand Laplace Transform, Linearity, first shifting theorem, Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem, Convolution, Integral Equations, Differentiation and integration of Transforms and to solve special linear ODE's with variable coefficients and Systems of ODEs
CO6	Understand Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions.

3CO3 MAT-CH: Mathematics for Chemistry III

Unit I - First Order Ordinary Differential Equations (25 hrs)
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig.
Basic concepts, Geometrical meaning of *y'=f* (*x*, *y*). Direction Fields (numerical method by Euler is excluded), Separable ODEs (modelling is excluded) , Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics is excluded).
(Sections 1.1, 1.2, 1.3, 1.4, 1.5)

Unit II: Second Order Ordinary Differential Equations (20 hrs)
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley.
Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of Theorems only, proofs omitted), Nonhomogeneous ODEs, Solution by variation of Parameters.
(Sections 2.1 to 2.10 *except* 2.4, 2.8 and 2.9)

Unit III: Laplace Transforms and its Applications (25 hrs)
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley.
Laplace Transform, Linearity, first shifting theorem (*s*-Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem (*t*- Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.
(Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 (Proofs are omitted))

Unit IV Fourier Series (20 hrs)
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley.
Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions. (Proofs are omitted)
(Sections 11.1, 11.2)

References

1. Higher Engineering Mathematics (41st edition), B .S. Grewal, Khanna Pub.

2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley
3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equtions, E.A. Coddington, Printice Hall
5. A Text of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	19	**40**
II	16	
III	18	
IV	13	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)

- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 21)

- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)

- ***Answer any 2 questions*** *(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 4:

MATHEMATICS FOR CHEMISTRY IV

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
IV	4C04 MAT-CH	5	3	3	40	10	50

COURSE OUTCOMES

CO1	Understand Partial Differential Equations, Modeling, Vibrating String, Wave Equation..
CO2	Solve PDE by Separating Variables, by use of Fourier Series, D-Alembert's solution of the wave equation and Heat Equation.
CO3	Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule
CO4	Understand Numerical methods to find Solutions of Ordinary Differential Equations: Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.
CO5	Understand volumes of solid using cross sections and areas of surfaces of revolution

4C04 MAT-CH: Mathematics for Chemistry IV

Unit I - Partial differential Equations (30 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley.

Basic Concepts, Modeling: Vibrating String, Wave Equation, Solution by Separating Variables, Use of Fourier Series, D-Alembert's solution of the wave equation, Heat Equation, Solution by Fourier Series.

(sections 12.1, 12.2, 12.3, 12.4, 12.5, 12.6) (*Excluding* steady two dimensional heat problems and Laplace equation of 12.5).

Unit II - Numerical Analysis (30 hrs)

Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastry, PHI Learning

Numerical Integration - Trapezoidal Rule, Simpson's 1/3-Rule

(Sections 6.4, 6.4.1, 6.4.2)

Numerical Solutions of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

(Sections 8.1, 8.2, 8.4, 8.4.2, 8.5)

Unit III - Group Theory

Text: Group Theory in Chemistry, M.S. Gopinathan and V. Ramakrishnan, Vishal Pub. Co. (30 hrs)

Symmetry elements and symmetry operations: Identity, rotation, reflection, improper rotation and inversion.

Group theory - Definition of group, order of a group, classes and similarity transformations, point group classifications, subgroups- group multiplication table. Matrix representation of symmetry operations – rotation, reflection, identity.

(Sections 1.1, 1.2, 2.1, 2.2, 2.3, 3.1, 3.2).

References

1. Higher Engineering Mathematics (41st edition), B .S. Grewal, Khanna Pub.
2. Mathematical methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.
3. Molecular Symmetry and Group Theory, Robert L. Carter, Wiley.
4. Chemical Applications of Group Theory (3rd edition), F. Albert Cotton, Wiley

5. Group Theory and Symmetry in Chemistry, Gurudeep Raj, Ajay Bhagi and Vinod Jain, Krishna Prakashan Media.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	22	**40**
II	22	
III	22	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

MATHEMATICS COMPLEMENTARY ELECTIVE COURSES FOR BSc STATISTICS PROGRAMME

COMPLEMENTARY ELECTIVE COURSE 1:

MATHEMATICS FOR STATISTICS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
I	1C01 MAT-ST	4	3	3	40	10	50

COURSE OUTCOMES

CO1	Understand Differentiation and Successive Differentiation
CO2	Understand Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the nth derivative of the product of two Sections
CO3	Understand Applications of Differentiation
CO5	Understand Matrices and System of Equations, Linear Transformations
CO6	Understand Lines and planes in space, curves in space and their tangents, curvature and normal vector of a curve, tangential and normal components of acceleration, directional derivative, gradient vectors, divergence and curl

1C01 MAT-ST: Mathematics for Statistics I

Unit I- Differential Calculus - Differentiation and Successive Differentiation (16 hours)

Text: Differential Calculus, Shanti Narayan and P.K. Mittal

Quick review of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. **(Questions should not be asked in the End Semester Examinations from the above sections for quick review).** Relevant portions from sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10

Text: Higher Engineering Mathemaics (41st edition), B.S. Grewal, Khanna Pub.

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the n^{th} derivative of the product of two functions.

(Sections 4.1, 4.2)

Unit II- Differential Calculus – Applications of Differentiation (20 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem, Taylor's theorem (Generalised mean value theorem)(without proof), expansions of functions – Maclaurin's series, expansion by use of known series, Taylor's series.

Indeterminate forms - form 0/0, form ∞/∞, forms reducible to 0/0 form - form 0.∞, form ∞-∞, forms 0^0, 1^∞, ∞^0

(Sections 4.3, 4.4, 4.5)

Unit III- Linear Algebra - Matrices and System of Equations, Linear Transformations (20 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Rank of a matrix, elementary transformation of a matrix, equivalent matrices elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equatios in *n* unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence

(Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)

Unit IV- Vector Differential Calculus (16 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Lines and planes in space, curves in space and their tangents, curvature and normal vector of a curve, tangential and normal components of acceleration, directional derivatives and gradient vectors (Sections 12.5, 13.1, 13.3, 13.4, 13.5, 14.5)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley.

Divergence and curl (Sections 9.8 and 9.9)

Reference

1. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
2. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand
3. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
4. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
5. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	17	**40**
II	20	
III	17	
IV	12	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)
- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)
- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 21)
- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)
- ***Answer any 2 questions*** *(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 2:
MATHEMATICS FOR STATISTICS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
II	2C02 MAT-ST	4	3	3	40	10	50

COURSE OUTCOMES

CO1	Understand Partial Differentiation: Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables
CO2	Understand Integration and Integration by Successive Reduction, Integration of Trigonometric Functions
CO3	Understand Applications of Integration and Multiple Integrals
CO4	Understand Eigen Values and Eigen vectors, Cayley-Hamilton Theorem

2C02 MAT-ST: Mathematics for Statistics II

Unit I- Differential Calculus - Partial Differentiation (17 hours)
Text: Higher Engineering Mathematics (41st edition), B.S. Grewal
Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.
(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

Unit II- Integral Calculus – Integration and Integration by Successive Reduction (17 hours)
Text: Integral Calculus, Santhi Narayanan and P.K. Mittal, S. Chand
Quick review of basics of Integration *(Questions should **not** be asked in the End Semester Examinations from the above sections for quick review)*
(Sections 8.1, 8.2, 8.3, 8.4, 8.5)

Integration of Trigonometric Functions: Integration of $\sin^n x$ where n is a positive integer, Integration of $sin^n x,$ evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^n x\,dx$, Integration of $cos^n x$, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} cos^n x\,dx$, Integration of $sin^p x cos^q x,$ evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^p x\, cos^q x dx$, integration of $tan^n x$, integration of $cot^n x$, integration of $sec^n x$, integration of $cosec^n x$
(Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2)

Unit III Integral Calculus – Applications of Integration and Multiple Integrals (20 hours)
Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services, 2016
Substitutions and the area between curves, arc length, areas and length in polar coordinates (Section 5.6, 6.3, 11.5)

Multiple Integrals- Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates, triple integrals in cylindrical and spherical co-ordinates, substitutions in multiple integrals
(Sections 15.1, 15.2, 15.3, 15.4, 15.5, 15.7, 15.8)

Unit IV
Linear Algebra – Eigen Values and Cayley-Hamilton Theorem (18 hours)
Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.
Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form
(Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18)

Reference

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
3. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	**Maximum Marks**
I	17	**40**
II	17	
III	20	
IV	12	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 3:

MATHEMATICS FOR STATISTICS III

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
III	**3C03 MAT-ST**	**5**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Geometrical meaning of First order ordinary differential equation $y'=f(x, y)$. Direction Fields , Separable ODEs , Exact ODEs, Linear ODEs, Bernoulli Equation
CO2	Understand Homogeneous Linear ODEs of second order, Differential Operators, Euler-Cauchy Equation, Wronskian solution by variation of Parameters
CO3	Understand Laplace Transform, first shifting theorem ,Transforms of Derivatives and Integrals, unit step Function, Convolution, General Formulas, Table of Laplace Transforms
CO4	Understand Fourier series, arbitrary period, , Even and Odd functions, Half-range Expansions

3C03 MAT-ST: Mathematics for Statistics III

Unit I- First Order Ordinary Differential Equations (24 hours)
Text: Advanced Engineering Mathematics (10^{th} edition), E. Kreyszig , Wiley

Basic concepts, Geometrical meaning of $y' = f(x, y)$. Direction Fields (numerical method by Euler excluded), Separable ODEs (modelling is excluded), Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics is excluded)

Chapter 1 Sections 1.1, 1.2, 1.3, 1.4, 1.5

Unit II- Second Order Ordinary Differential Equations (24 hours)
Text: Advanced Engineering Mathematics (10^{th} edition), E. Kreyszig, Wiley

Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of Theorems only, proofs are omitted), Nonhomogeneous ODEs, Solution by variation of Parameters. Sections 2.1 to 2.10 except 2.4, 2.8 and 2.9

Unit III- Laplace Transforms and its Applications (24 hours)
Text: Advanced Engineering Mathematics (10^{th} edition), E. Kreyszig, Wiley

Laplace Transform, Linearity, first shifting theorem (*s*-Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem (*t*- Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.

Chapter 6 Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 (Proofs of theorems are omitted)

Unit IV Fourier Series (18 hours)
Text: Advanced Engineering Mathematics (10^{th} edition), E. Kreyszig, Wiley

Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions. (Proofs are omitted)

Chapter 11 Sections 11.1, 11.2

References

1. Higher Engineering Mathematics (41^{st} edition), B .S. Grewal, Khanna Pub.

2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley
3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equtions, E.A. Coddington, Printice Hall
5. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	**Maximum Marks**
I	18	**40**
II	16	
III	18	
IV	14	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 4:
MATHEMATICS FOR STATISTICS IV

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
IV	4C04 MAT-ST	5	3	3	40	10	50

COURSE OUTCOMES

CO1	Understand Partial Differential Equations ,Basic Concepts, solution by separation of variables
CO2	Understand Solution of Algebraic and Transcendental Equation : Bisection Method, Method of false position, Newton-Raphson Method
CO3	Understand Finite differences , forward differences, Backward differences, Interpolation, Divided differences and their properties
CO4	Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule
CO5	Understand Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta method
CO6	Understand Volume and Surface Area of Revolution

4C04 MAT-ST: Mathematics for Statistics IV

Unit I- Partial Differential Equations (18 hours)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Basic Concepts, solution by separation of variables, use of Fourier series

Sections 12.1, 12.3

Unit II- Numerical Analysis (28 hours)

Text: Introductory Methods of Numerical Analysis (5th edition), S.S. Sastry, PHI Learning.

Solution of Algebraic and Transcendental Equation: Introduction**,** Bisection Method, Method of false position, Newton-Raphson Method

Chapter 2 Sections 2.1, 2.2, 2.3 and 2.5

Finite Differences and Interpolation: Introduction, finite differences **- f**orward differences, Backward differences, Interpolation with unevenly spaced points Newton's formulae for interpolation, Interpolation with unevenly spaced points - Langrange's interpolation formula, Divided differences and their properties, Newton's general interpolation formula

Sections 3.1, 3.3, 3.3.1, 3.3.2, 3.6, 3.9, 3.9.1, 3.10, 3.10.1

Unit III- Numerical Analysis (26 hours)

Text: Introductory Methods of Numerical Analysis (5th edition), S.S. Sastry, PHI Learning

Numerical Integration **-** Trapezoidal Rule, Simpson's 1/3-Rule

Chapter 6 Sections 6.4, 6.4.1, 6.4.2

Numerical Solutions of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

Sections 8.1, 8.2, 8.4, 8.4.2, 8.5

Unit IV- Integral Calculus – Volume and Surface Area of Revolution (18 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.

Volumes using cross sections, areas of surfaces of revolution.

Sections 6.1, 6.4

References

1. Higher Engineering Mathematics (41st edition), B .S. Grewal, Khanna Pub
2. Mathematical methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.
3. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
4. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	**Maximum Marks**
I	13	**40**
II	20	
III	20	
IV	13	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)

- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 21)

- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)

- ***Answer any 2 questions*** *(2 questions x Marks 5 each=10).*

MATHEMATICS COMPLEMENTARY ELECTIVE COURSES FOR BSc ELECTRONICS PROGRAMME

COMPLEMENTARY ELECTIVE COURSE 1:

MATHEMATICS FOR ELECTRONICS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
I	1C01 MAT-EL	4	3	3	40	10	50

COURSE OUTCOMES

CO1	Understand functions of two or more variables, limits, continuity, partial derivatives,.
CO2	Understand homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables
CO3	Understand lines , planes curves in space , their tangents, curvature and normal, tangential and normal components of acceleration, directional derivatives and gradient vectors.
CO4	Understand Rank of a matrix, elementary transformation of a matrix, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse,
CO5	Understand Cramer's rule, matrix inversion method to find solution of linear system of equations
CO6	Understand Rouche's theorem, procedure to test the consistency of a system of equations
CO7	Understand linear transformations, orthogonal transformation,
CO8	Understand linear dependence and independence.
CO9	Understand Probability distributions and curve fitting

1C01 MAT-EL: Mathematics for Electronics I

Unit I - Differential Calculus (16 hours)

Text: Differential Calculus, Shanti Narayan and P.K. Mittal

Quick review of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. *(Questions should not be asked in the End Semester Examinations from the above sections for quick review)*
(Relevant portions from sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10)

Text: Differential Calculus, Higher Engineering Mathematics (41th edition), B.S. Grewal, Khanna Pub

Partial Differentiation: Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.
(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

Unit II - Vector Differentiation and Geometry (16 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services

Lines and planes in space, curves in space and their tangents, curvature and normal vector of a curve, tangential and normal components of acceleration, directional derivatives and gradient vectors.
(Sections 12.5, 13.1, 13.3, 13.4, 13.5, 14.5)

Unit III: Linear Algebra – Matrices and System of Equations, Linear Transformations (25 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub

Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear

homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence
(Sections 2.7, 2.8, 2.9, 2.10, 2.11, 2.12)

Unit IV: Probability distributions and curve fitting (15 hours)
Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Introduction, graphical method, laws reducible to the linear law, principles of least squares, method of least squares, to fit the straight line y=a+bx, to fit the parabola $y=a+bx+cx^2$, fitting of $y=ax^b$, $y=ae^{bx}$, $xy^n=b$
(Sections 24.1, 24.2, 24.3, 24.4, 24.5)
Random variable, Discrete probability distribution, continuous probability distribution, expectation, variance, r^{th} moment, mean deviation from mean.
(Sections 26.7, 26.8, 26.9, 26.10)

References

1. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
2. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
3. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand and Co.
4. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
5. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
6. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.
7. Fundamentals of Mathematical Statistics, S.C. Gupta and V.K. Kapoor, Sultan Chand

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	16	
III	20	
IV	14	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 2:

MATHEMATICS FOR ELECTRONICS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
II	**2C02 MAT-EL**	**4**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand the reduction formulae to integrate powers of trigonometric functions
CO2	Understand the method to find area between curves, arc length both in Polar and Cartesian coordinates
CO3	Understand the method of evaluating multiple integrals
CO4	Understand the concept of eigen values and eigen vectors, properties of eigen values and Cayley- Hamilton theorem
CO5	Understand reduction to diagonal form and reduction of quadratic form to canonical form.
CO6	Understand line integrals in vector fields and Green's theorem in the plane
CO7	Understand Surfaces and area, surface integrals, Stoke's theorem, the divergence theorem and unified theory

2C02 MAT-EL: Mathematics for Electronics II

Unit I - Integral Calculus – Integration and Integration by Successive Reduction (18 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services, 2016

Quick review of basics of Integration (*Questions should **not** be asked in the End Semester Examinations from the above sections for quick review*)

Text: Integral Calculus, Santhi Narayanan and P.K. Mittal

Integration of Trigonometric Functions: Integration of $\sin^n x$ where n is a positive integer, Integration of $\cos^n x$ where n is a positive integer, Integration of $\sin^p x \cos^q x$ where p, q are positive integers, Integration of $\tan^n x$ and $\cot^n x$ where n is a positive integer, Integration of $\sec^n x$ where n is a positive integer.
(Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2)

Unit II - Integral Calculus – Applications of Integration and Multiple Integrals (18 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services

Substitutions and the area between curves, arc length, Polar coordinates, areas and length in polar coordinates
(Section 5.6, 6.3, 11.3, 11.5)

Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates.
(Sections 15.1, 15.2, 15.3, 15.4, 15.5)

Unit III Linear Algebra (18 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form
(Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18)

Unit IV Vector Calculus – Vector Integration (18 hours)

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services

Line integrals (mass, moment and moment of inertia excluded), vector fields and line integrals: work, circulation and flux, path independence, conservative fields and potential functions, Green's theorem in the plane.
(Sections 16.1, 16.2, 16.3, 16.4)
Surfaces and area, surface integrals, Stoke's theorem (theorem without proof) (paddle wheel interpretation of $\nabla\times\mathbf{F}$ is excluded), the Divergence Theorem (theorem without proof) (Gauss' law: one of the four great laws of Electromagnetic Theory, continuity equation of hydrodynamics and unifying the integral theorems are excluded).
(Sections 16.5, 16.6, 16.7, 16.8 of the Text).

References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
3. Introduction to Vector Analysis, H. F. Davis and Arthur David Snider, Universal Book Stall, New Delhi.
4. Vector Analysis, M. R. Spiegel, Schaum's Outline Series, Asian Student edition
5. Vector Calculus, F.W. Bedford and T.D. Dwivedi, McGraw Hill.
6. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	16	
III	18	
IV	16	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)

- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 21)

- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)

- ***Answer any 2 questions*** *(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 3:
MATHEMATICS FOR ELECTRONICS III

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
III	**3C03 MAT-EL**	**5**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Separable ODEs, Exact ODEs, Linear ODEs, Bernoulli equation and methods to solve these ODEs
CO2	Understand Homogeneous Linear ODEs of Second Order and solve homogeneous linear ODEs of second order with constant coefficients and Euler-Cauchy equation
CO3	Understand Nonhomogeneous ODEs and solve by variation of parameters
CO4	Understand Laplace Transform and inverse Laplace Transformation
CO5	Understand The first and The second shifting theorems and their applications
CO6	Understand the methods to find Laplace transforms of derivatives and integrals of functions
CO7	Understand the method of differentiating and integrating Laplace transform
CO8	Understand convolution, convolution theorem and applications of convolution Theorem
CO9	Solve ordinary differential equations and integral equations using Laplace transform
CO10	Understand Fourier series and Fourier Transform

3C03 MAT-EL: Mathematics for Electronics III

Unit I - First Order Ordinary Differential Equations (26 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig

Basic concepts, Geometrical meaning of $y'=f(x,y)$. Direction Fields (numerical method by Euler excluded), Separable ODEs (modelling excluded) Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics excluded) (Sections 1.1, 1.2, 1.3, 1.4, 1.5)

Unit II - Second Order Ordinary Differential Equations (22 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of Theorems only, proofs omitted), Nonhomogeneous ODEs, Solution by variation of Parameters.
(Sections 2.1 to 2.10 *except* 2.4, 2.8 and 2.9)

Unit III - Laplace Transforms and its Applications (24 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Laplace Transforms: Laplace Transform, Linearity, first shifting theorem (s-Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem (t- Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.
(Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 (Proofs omitted))

Unit IV Fourier Series and Fourier Transforms (18 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions. (Proofs are omitted) (Sections 11.1, 11.2)

Fourier integral, Fourier cosine and sine transform (discrete only), Inverse transform (Sections 11.7, 11.8, 11.9. Convolution is excluded).

References

1. Higher Engineering Mathematics (41st edition), B .S. Grewal, Khanna Pub.
2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley
3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equtions, E.A. Coddington, Printice Hall
5. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	19	**40**
II	16	
III	17	
IV	14	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)

- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 21)

- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)

Answer any 2 questions *(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 4:
MATHEMATICS FOR ELECTRONICS IV

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
IV	4C04 MAT-EL	5	3	3	40	10	50

COURSE OUTCOMES

CO1	Understand Partial Differential equations, its solution by Separating Variables and the use of Fourier Series in solving PDE
CO2	Understand LPP, formulate and solve using graphical method
CO3	Understand General LPP, canonical and standard forms of LPP
CO4	Understand simplex method and solve LPP
CO5	Understand basic solution, degenerate solution, basic feasible solution, optimum basic feasible solution , fundamental properties of solution and simplex method
CO6	Understand LP formulation of transportation problem and method to solve
CO7	Understand the concept of Numerical Integration , Trapezoidal Rule, Simpson's 1/3 Rule
CO8	Understand Taylor's series method, Euler's method, Modified Euler's method and Runge-Kutta methods to solve ordinary differential equations.

4C04 MAT-EL: Mathematics for Electronics IV

Unit I - Partial differential Equations (20 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Basic Concepts, solution by separation of variables, use of Fourier series
(Sections 12.1, 12.3)

Unit II - Linear Programming (25 hrs)

Text: Operations Research (18th thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.

Mathematical formulation of daily life situations – simple cases only (Questions should be avoided for end semester examination) Canonical and standard form, Graphical solution method, Simplex method – computational procedure (Proof of theorems excluded)
(Sections 2.1, 2.2, 2.3, 2.4, 3.2, 4.3)

Unit III Linear Programming (20 hrs)

Text: Operations Research (18th thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.

Transportation problem – introduction, transportation table, loops, solution to a Transportation Problem, finding an initial basic feasible solution, transportation algorithm (MODI method) (Proofs of theorems are excluded)
(Sections 10.5, 10.6, 10.8, 10.9, 10.13)

Unit IV Numerical Analysis (25 hrs)

Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastry, PHI Learning

Numerical Integration- Trapezoidal Rule, Simpson's 1/3 -Rule.
(Sections 6.4, 6.4.1, 6.4.2)
Numerical Solutions of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods. (Sections 8.1, 8.2, 8.4, 8.4.2, 8.5)

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	Maximum Marks
I	12	**40**
II	19	
III	16	
IV	19	
Total	**66**	

References

1. Higher Engineering Mathematics (41st edition), B .S. Grewal, Khanna Pub
2. Linear Programming, G. Hadley, Oxford & IBH Publishing Company, New Delhi.
3. Operations Research, S. Kalavathy, Vikas Pub.
4. Mathematical Methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

MATHEMATICS
COMPLEMENTARY ELECTIVE COURSES FOR BSc COMPUTER SCIENCE PROGRAMME

COMPLEMENTARY ELECTIVE COURSE 1:

MATHEMATICS FOR COMPUTER SCIENCE I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
I	**1C01 MAT-CS**	**4**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Successive differentiation and Leibnitz's theorem for the nth derivative of the product of two functions
CO2	Understand Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem and Cauchy's mean value theorem.
CO3	Understand Taylor's theorem, expansions of functions – Maclaurin's series, expansion by use of known series and Taylor's series.
CO4	Understand the method of finding limits of Indeterminate forms.
CO5	Understand Polar, Cylindrical and Spherical co-ordinates.
CO6	Understand Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix and partition method of finding the inverse.
CO7	Understand solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations.
CO8	Understand Linear transformations, orthogonal transformation and linear dependence of vectors.
CO9	Understand methods of curve fitting, graphical method, laws reducible to the linear law, principles of least squares, method of least squares and apply the principle of least squares to fit the straight line $y = a+bx$, to fit the parabola $y=a+bx+cx^2$, to fit $y = ax^b$, $y =ae^{bx}$ and $xy^n=b$

1C01 MAT-CS: Mathematics for Computer Science I

Unit I Differential Calculus – Differentiation and Successive Differentiation (18 Hours)

Text: Differential Calculus, Shanti Narayan and P.K. Mittal

Quick review of basics of differentiation – Derivatives of standard functions, rules of differentiation, parametric differentiation. *(Questions should not be asked in the End Semester Examinations from the above sections for quick review)(*Relevant portions from sections 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10)

Text: Higher Engineering Mathemaics (41rd edition), B.S. Grewal,

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the nth derivative of the product of two Sections 4.1, 4.2

Unit II: Differential Calculus – Applications of Derivatives (22 Hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem, Cauchy's mean-value theorem, Taylor's theorem (Generalised mean value theorem)(without proof), expansions of functions – Maclaurin's series, expansion by use of known series, Taylor's series, Indeterminate forms - form 0/0, form ∞/∞, form reducible to 0/0 form - form 0.∞, form ∞-∞, forms 0^0,1^∞, ∞^0 (Sections 4.3, 4.4, 4.5).

Unit III Linear Algebra - Matrices and System of Equations, Linear Transformations (20 Hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Rank of a matrix, elementary transformation of a matrix, equivalent matrix,s elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equatios in n unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence

Sections 2.8, 2.9, 2.10, 2.11, 2.12, 2.13

Unit IV Fitting of Curves

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Introduction, graphical method, laws reducible to the linear law, principles of least squares, method of least squares, to fit the straight line y=a+bx, to fit the parabola $y=a+bx+cx^2$

Sections 24.1, 24.2, 24.3, 24.4, 24.5

References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
5. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
6. Fundamentals of Mathematical Statistics, S.C. Gupta and V.K. Kapoor, Sultan Chand

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	18	**40**
II	20	
III	18	
IV	10	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)
- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)
- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - **Essay** (7 questions x Marks 3 each = 21)
- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)
- ***Answer any 2 questions*** *(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVECOURSE 2:

MATHEMATICS FOR COMPUTER SCIENCE II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
II	**2C02 MAT-CS**	**4**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Functions of two or more variables, limits and continuity.
CO2	Understand partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions and change of variables.
CO3	Understand Reduction formulae for trigonometric functions and evaluation of definite integrals $\int_0^{\frac{\pi}{2}} sin^n x\, dx$, $\int_0^{\frac{\pi}{2}} cos^n x\, dx$ and $\int_0^{\frac{\pi}{2}} sin^p x\, cos^q x dx$.
CO4	Understand Substitutions and the area between curves, arc length, areas and length in polar coordinates.
CO5	Understand Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form and triple integrals in rectangular co-ordinates.
CO6	Understand Eigen values, Eigen vectors, properties of Eigen values, Cayley- Hamilton theorem, reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form and nature of a quadratic form

2C02 MAT-CS: Mathematics for Computer Science II

Unit I Differential Calculus – Partial Differentiation

Text: Differential Calculus, Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Partial Differentiation: Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

Sections 5.1, 5.2, 5.4, 5.5, 5.6

Unit II Integral Calculus – Integration and Integration by Successive Reduction

Text: Integral Calculus, Santhi Narayanan and P.K. Mittal, S. Chand and Co.

Quick review of basics of Integration (*Questions should* ***not*** *be asked in the End Semester Examinations from the above sections for quick review*)

Sections 8.1, 8.2, 8.3, 8.4, 8.5

Integration of Trigonometric Functions: Integration of $sin^n x,$ where n is a positive integer, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^n x \, dx$, Integration of $cos^n x$, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} cos^n x \, dx$,Integration of $sin^p x cos^q x,$evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^p x \, cos^q x dx$, integration of $tan^n x$, integration of $cot^n x,$ integration of $sec^n x$, integration of $cosec^n x$

Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1, 4.4.2, 4.5.1, 4.5.2

Unit III Integral Calculus – Applications of Integration and Multiple Integrals

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services

Substitutions and the area between curves, arc length, Polar coordinates, areas and length in polar coordinates

Section 5.6, 6.3, 11.3, 11.5

Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form, triple integrals in rectangular co-ordinates

Sections 15.1, 15.2, 15.3, 15.4, 15.5

Unit IV Linear Algebra - Eigen Values and Cayley-Hamilton Theorem

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof), reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form

Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18.

References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co.
3. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
5. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	17	**40**
II	20	
III	17	
IV	12	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 3:

MATHEMATICS FOR COMPUTER SCIENCE III

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
III	**3C03 MAT-CS**	**5**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Ordinary differential equations, Geometrical meaning of $y' = f(x, y)$ and Direction Fields.
CO2	Understand Methods of solving Differential Equations: Separable ODEs, Exact ODEs, Integrating Factors, Linear ODEs and Bernoulli Equation.
CO3	Understand Orthogonal Trajectories, Existence and Uniqueness of Solutions.
CO4	Understand Second order ODEs, Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian, Non homogeneous ODEs and Solution by variation of Parameters
CO5	Understand Laplace Transform, Linearity, first shifting theorem, Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem, Convolution, Integral Equations, Differentiation and integration of Transforms and to solve special linear ODE's with variable coefficients and Systems of ODEs
CO6	Understand Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions.
CO7	Understand Partial Differential Equations and to solve PDEs by separation of variables and by use of Fourier series.

3C03 MAT-CS: Mathematics for Computer Science III

Unit I First Order Ordinary Differential Equations
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, 2015
Basic concepts, Geometrical meaning of $y'=f(x, y)$. Direction Fields (numerical method by Euler excluded), Separable ODEs (modelling excluded) Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics excluded) Chapter 1 Sections 1.1, 1.2, 1.3, 1.4, 1.5

Unit II: Second Order Ordinary Differential Equations
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley, 2015
Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of Theorems only, proofs omitted), Non homogeneous ODEs, Solution by variation of Parameters.
Sections 2.1 to 2.10 *except* 2.4, 2.8 and 2.9

Unit III: Laplace Transforms and its Applications
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
Laplace Transforms: Laplace Transform, Linearity, first shifting theorem (*s*-Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem (*t*- Shifting), Convolution, Integral Equations, Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Systems of ODEs, Laplace Transform, General Formulas, Table of Laplace Transforms.
Chapter 6 Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9 (Proofs omitted)

Unit IV Fourier Series and Partial Differential Equations
Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions. (Proofs omitted)
Chapter 11 Sections 11.1, 11.2

Partial Differential Equations - Basic Concepts, solution by separation of variables, use of Fourier series Sections 12.1, 12.3

References

1. Higher Engineering Mathematics (41st edition), B .S. Grewal, Khanna Pub.

2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley
3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equtions, E.A. Coddington, Printice Hall
5. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	18	**40**
II	15	
III	15	
IV	18	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	Essay	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY COURSE 4:
MATHEMATICS FOR COMPUTER SCIENCE IV

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
IV	**4C04 MAT-CS**	**5**	**3**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand the concept of a graph, graphs as models, vertex degrees, sub graphs, paths and cycles, matrix representation of graphs, trees and connectivity – definition and simple properties.
CO2	Understand Linear Programming Problems, their canonical and standard forms.
CO3	Understand Methods to solve LPP : Graphical solution method and Simplex method
CO4	Understand Transportation problems, transportation table, loops. Solve a Transportation Problem by finding an initial basic feasible solution and then by using the transportation algorithm known as MODI method.
CO5	Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule
CO6	Understand Numerical methods to find Solutions of Ordinary Differential Equations: Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

4C04 MAT-CS: Mathematics for Computer Science IV

Unit I

Text: A First Look at Graph Theory, John Clark and Derek Allan Holton, Allied Pub.

The definition of a graph, graphs as models, More definitions (problems on isomorphism excluded), vertex degrees, subgraphs, paths and cycles, matrix representation of graphs, trees and connectivity – definition and simple properties (Proofs of theorems 2.1, 2.2, 2.3, 2.5 and that of corollary 2.4 are excluded) (Problems involving proofs are excluded)

Sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1

Unit II Linear Programming

Text: Operations Research (18th thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.

Mathematical formulation of daily life situations – simple cases only (Questions should be avoided for end semester examination from this topic)

Canonical and standard form, Graphical solution method, Simplex method – computational procedure (Proofs of theorems are excluded)

Sections 2.1, 2.2, 2.3, 2.4, 3.2, 4.3

Unit III Linear programming

Text: Operations Research (18th thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.

Transportation problem – introduction, transportation table, loops, solution to a Transportation Problem, finding an initial basic feasible solution, transportation algorithm (MODI method)

(Proofs of theorems excluded)

Sections 10.5, 10.6, 10.8, 10.9, 10.13

Unit IV Numerical Analysis

Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastry PHI Learning

Numerical Integration-

Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule

Chapter 6 Sections 6.4, 6.4.1, 6.4.2

Numerical Solutions of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods.

Sections 8.1, 8.2, 8.4, 8.4.2, 8.5

References

1. Introduction to Graph Theory, F. Harary, Narosa Pub.
2. Graph Theory with Applications, J.A. Bondy and U.S.R.Murty, Macmillan
3. Linear Programming, G. Hadley, Oxford & IBH Publishing Company, New Delhi.
4. Operations Research, S. Kalavathy, Vikas Pub.
5. Mathematical Methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	18	
III	16	
IV	16	
Total	**66**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)
- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)
- ***Answer any 7 questions*** *(7 questions x Marks 2 each=14)*

Part C - Essay (7 questions x Marks 3 each = 21)
- ***Answer any 4 questions*** *(4 questions x Marks 3 each=12)*

Part D - **Long Essay** (4 questions x Marks 5 each = 20)
- ***Answer any 2 questions*** *(2 questions x Marks 5 each=10).*

MATHEMATICS
COMPLEMENTARY ELECTIVE COURSES FOR BCA PROGRAMME

COMPLEMENTARY ELECTIVE COURSE 1:

MATHEMATICS FOR BCA I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
I	**1C01 MAT-BCA**	**4**	**4**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO 1	Understand differentiation, derivative of functions namely constant function, trigonometric function, inverse trigonometric functions, y = log x, hyperbolic functions and parametrically defined function, Logarithmic differentiation and derivative of implicitly defined functions.
CO 2	Understand Successive differentiation and Leibnitz's theorem for the nth derivative of the product of two functions.
CO 3	Understand Basics of Boolean Algebra: Definition, duality and basic theorems.
CO 4	Understand Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix and partition method of finding the inverse.
CO 5	Understand solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equations in n unknowns, system of linear homogeneous equations.
CO 6	Understand Linear transformations, orthogonal transformation and linear dependence of vectors.

1C01 MAT-BCA: Mathematics for BCA I

Unit I - Differential Calculus – Differentiation

Text: Differential Calculus, Shanti Narayan and P.K. Mittal

Basics of differentiation – Derivative of a constant function, some general theorems on derivation (theorems without proof), derivatives of trigonometric functions, derivatives of inverse trigonometric functions, derivative of $y = \log x$, hyperbolic functions, derivation of parametrically defined functions, logarithmic differentiation, derivation of implicitly defined functions.

(Sections 4.2, 4.3 except 4.3.5, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10)

Unit II - Differential Calculus– Successive Differentiation

Text: Higher Engineering Mathemaics (41st edition), B.S. Grewal

Successive differentiation, standard results, preliminary transformations, use of partial fractions, Leibnitz's theorem for the nth derivative of the product of two functions

(Sections 4.1, 4.2)

Unit III - Boolean Algebra

Text: Set Theory and Related Topics, S. Lipschitz, Schaum's Series

Introduction, basic definition, duality, basic theorems

(Sections 11.1, 11.2, 11.3, 11.4)

Unit IV - Linear Algebra - Matrices and System of Equations, Linear Transformations

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal

Rank of a matrix, elementary transformation of a matrix, equivalent matrix,s elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix, partition method of finding the inverse, solution of linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of linear system of equations, Rouche's theorem, procedure to test the consistency of a system of equatios in n unknowns, system of linear homogeneous equations. Linear transformations, orthogonal transformation, vectors – linear dependence

(Sections 2.7, 2.8,2.9, 2.10, 2.11, 2.12)

References

1. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley
2. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
3. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co

4. Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.
5. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	15	**40**
II	17	
III	13	
IV	21	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	- ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	- ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	- ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	- ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 2:
MATHEMATICS FOR BCA II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
II	**2C02 MAT-BCA**	**4**	**4**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Functions of two or more variables, limits and continuity.
CO2	Understand partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions and change of variables.
CO3	Understand basics of integration, Integration by parts, trigonometric integrals, trigonometric substitutions and integration of rational functions by partial fractions.
CO4	Understand Polar co-ordinates.
CO5	Understand Reduction formulae for trigonometric functions and evaluation of definite integrals $\int_0^{\frac{\pi}{2}} sin^n x\, dx$, $\int_0^{\frac{\pi}{2}} cos^n x\, dx$ and $\int_0^{\frac{\pi}{2}} sin^p x\, cos^q x dx$.
CO6	Understand Double and Iterated Integrals over rectangles, double integrals over general regions and triple integrals in rectangular co-ordinates.
CO7	Understand Eigen values, Eigen vectors, properties of Eigen values, Cayley- Hamilton theorem, reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form and nature of a quadratic form

2C02 MAT-BCA: Mathematics for BCA II

Unit I- Differential Calculus - Partial Differentiation

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal

Functions of two or more variables, limits, continuity, partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions, change of variables.

(Sections 5.1, 5.2, 5.4, 5.5, 5.6)

Unit II - Integral Calculus – Integration and Integration by Successive Reduction

Text: Integral Calculus, Santhi Narayanan and P.K. Mittal, S. Chand

Basics of Integration – Integration by parts, trigonometric integrals, trigonometric substitutions, integration of rational functions by partial fractions

(Sections 8.1, 8.2, 8.3, 8.4, 8.5)

Integration of Trigonometric Functions: Integration of $\sin^n x$ where n is a positive integer,

Integration of $sin^n x,$ evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^n x\, dx$, Integration of $cos^n x$, evaluation of the definite integral $\int_0^{\frac{\pi}{2}} cos^n x\, dx$, Integration of $sin^p x cos^q x,$ evaluation of the definite integral $\int_0^{\frac{\pi}{2}} sin^p x\, cos^q x dx$, integration of $tan^n x$ (Derivation of formulae omitted)

(Sections 4.1, 4.1.1, 4.2, 4.2.1, 4.3, 4.3.1, 4.4.1)

Unit III Integral Calculus – Multiple Integrals

Text: Thomas' Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services, 2016

Polar co-ordinates, Double and Iterated Integrals over rectangles, double integrals over general regions, triple integrals in rectangular co-ordinates

(Sections 11.3, 15.1, 15.2, 15.5)

Unit IV - Linear Algebra - Eigen Values and Cayley-Hamilton Theorem (22 hrs)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal

Eigen values, eigen vectors, properties of eigen values, Cayley- Hamilton theorem (without proof),reduction to diagonal form, similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form, nature of a quadratic form,

(Sections 2.13, 2.14, 2.15, 2.16, 2.17, 2.18)

References

1. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
2. Calculus (10th edition), Anton, Bivens, Davis, Wiley-India
3. A Textbook of Matrices, Shanti Narayan and P.K. Mittal, S. Chand & Co
4. Theory of and Problems of Matrices, Frank Ayres JR, Schaum's Outline Series, McGraw- Hill Book Company
5. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	16	
III	16	
IV	18	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 3:
MATHEMATICS FOR BCA III

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
III	**3C03 MAT-BCA**	**4**	**4**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO1	Understand Ordinary differential equations, Geometrical meaning of $y' = f(x, y)$ and Direction Fields.
CO2	Understand Methods of solving Differential Equations: Separable ODEs, Exact ODEs, Integrating Factors, Linear ODEs and Bernoulli Equation.
CO3	Understand Second order ODEs, Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian and Nonhomogeneous ODEs.
CO4	Understand Laplace Transform, Linearity, first shifting theorem, Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem, Convolution, Integral Equations, Differentiation and integration of Transforms and to solve special linear ODE’s with variable coefficients and Systems of ODEs
CO5	Understand Fourier series, arbitrary period and Even and Odd functions

3C03 AMT-BCA: Mathematics for BCA III

UnitI - First Order Ordinary Differential Equations (22 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley, 2015

Basic concepts, Geometrical meaning of $y'=f\ (x,\ y)$. Direction Fields (numerical method by Euler excluded), Separable ODEs (modelling excluded) Exact ODEs, Integrating Factors, Linear ODEs, Bernoulli Equation (population dynamics excluded

(Sections 1.1, 1.2, 1.3, 1.4, 1.5)

Unit II - Second Order Ordinary Differential Equations (16 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley, 2015

Homogeneous Linear ODEs of second order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian (statement of theorems only, proof omitted), Nonhomogeneous ODEs.

(Sections 2.1 to 2.9 *except* 2.4, 2.8)

Unit III - Laplace Transforms and its Applications (20 hrs)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley, 2015

Laplace Transform, Linearity, first shifting theorem (s-Shifting), Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem (t- Shifting), Convolution, Integral Equations,Differentiation and integration of Transforms, special linear ODE's with variable coefficients, Laplace Transform, General Formulas, Table of Laplace Transforms.

(Chapter 6 Sections 6.1, 6.2, 6.3, 6.5, 6.6, 6.8, 6.9 (Proofs omitted))

Unit IV Fourier Series (14 hours)

Text: Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley, 2015

Fourier series, arbitrary period, Even and Odd functions.(Proofs omitted)

(Chapter 11 Sections 11.1, 11.2 (half range expansions excluded))

References

1. Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.
2. Elementary Differential Equations and Boundary Value Problems, W.E. Boyce and R.C. Deprima, Wiley

3. Differential Equations, S.L. Ross, Wiley
4. An Introduction to Ordinary Differential Equtions, E.A. Coddington, Printice Hall
5. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	20	**40**
II	16	
III	16	
IV	14	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	Essay	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

COMPLEMENTARY ELECTIVE COURSE 4:
MATHEMATICS FOR BCA IV

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
IV	**4C04 MAT-BCA**	**4**	**4**	**3**	**40**	**10**	**50**

COURSE OUTCOMES

CO 1	Understand principle of counting, permutations, combinations, basic terminology.
CO 2	Understand the meaning of probability, probability and set notations, random experiment, sample space, event, axioms, notations, addition law of probability, theorem of total probability, independent events and multiplication law of probability
CO 3	Understand LPP, canonical and standard form, Graphical solution method, Simplex method and computational procedure.
CO 4	Understand Network routing problems: introduction, network flow problem, minimal spanning tree problem and shortest route problems.
CO 5	Understand Numerical Integration, Trapezoidal Rule and Simpson's 1/3-Rule.
CO 6	Understand Numerical methods to find Solutions of Ordinary Differential Equations: Solution by Euler's method and Runge-Kutta methods.
CO 7	Understand volumes of solid using cross sections and areas of surfaces of revolution

4C04 AMT-BCA: Mathematics for BCA IV

Unit I- Probability (18 hours)

Text: Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Pub.

Probabiliy – introduction, principle of counting, permutations, combinations, basic terminology, definition of probability, statistical definition of probability, probability and set notations, random experiment, sample space, event, axioms, notations, addition law of probability or theorem of total probability (proof excluded), independent events, multiplication law of probability.
(Sections 26.1, 26.2, 26.3, 26.4, 26.5)

Unit II- Linear Programming (24 hours)

Text: Operations Research (18th thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.

Mathematical formulation of daily life situations – simple cases only *(Questions should be avoided for end semester examination from this section).*

Canonical and standard form, Graphical solution method, Simplex method – computational procedure (Proof of theorems excluded)
(Sections 2.1, 2.2, 2.3, 2.4, 3.2, 4.3)

Unit III - Linear programming (14 hours)

Text: Operations Research (18th thoroughly revised edition), Kantiswaroop, P.K. Gupta and Manmohan, Sultan Chand & Sons.

Network routing problems – introduction, network flow problem, minimal spanning tree problem, shortest route problems (algorithm omitted)
(Sections 24.1, 24.2, 24.3, 24.4)

Unit IV - Numerical Analysis (16 hours)

Text: Introductory Methods of Numerical Analysis (fifth edition), S.S. Sastri PHI Learning, 2015

Numerical Integration: Trapezoidal Rule, Simpson's 1/3- Rule
(Sections 6.4, 6.4.1, 6.4.2)

Numerical Solutions of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Euler's method, Modified Euler's method, Runge-Kutta methods. (Sections 8.1, 8.2, 8.4, 8.4.2, 8.5)

References

1. Introduction to Probablity and Statistics, S. Lipschutz, J. Schiller, Schaum's Outline series
2. Linear Programming, G. Hadley, Oxford & IBH Publishing Company, New Delhi.
3. Operations Research, S. Kalavathy, Vikas Pub.
4. Mathematical methods, S. R. K. Iyengar and R. K. Jain, Narosa Pub
5. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	16	**40**
II	20	
III	14	
IV	16	
Total	**66**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 7 questions***	*(7 questions x Marks 2 each=14)*
Part C -	**Essay**	(7 questions x Marks 3 each = 21)
	• ***Answer any 4 questions***	*(4 questions x Marks 3 each=12)*
Part D -	**Long Essay**	(4 questions x Marks 5 each = 20)
	• ***Answer any 2 questions***	*(2 questions x Marks 5 each=10).*

PART C

MATHEMATICS GENERIC ELECTIVE COURSES

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

Any *one* Generic Elective Course from the following five courses can be chosen.

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS
5D01 MAT	**HISTORY OF MATHEMATICS**	**V**	2	2	2
5D02 MAT	**QUANTITATIVE ARITHMETIC AND REASONING**	**V**	2	2	2
5D03 MAT	**LINEAR PROGRAMMING**	**V**	2	2	2
5D04 MAT	**GRAPH THEORY**	**V**	2	2	2
5D05 MAT	**BUSINESS MATHEMETICS**	**V**	2	2	2

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	4
INTERNAL	1

INTERNAL ASSESSMENT

COMPONENT	WEIGHTAGE	MARKS	REAMARKS
COMPONENT1- ASSIGNMENT / SEMINAR / VIVA-VOCE	50%	2.5	For each course, a student has to submit one assignment/ attend one seminar/ attend one viva-voce
COMPONENT 2- TEST PAPER	50%	2.5	For each course, a student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.
TOTAL	100%	**5**	

GENERIC ELECTIVE COURSE 1:
HISTORY OF MATHEMATICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5D01 MAT	2	2	2	20	5	25

COURSE OUTCOMES

CO1	Understand the history of Early Number Systems and Symbols.
CO2	Understand the history of Mathematics in Early Civilizations.
CO3	Understand the history of the Beginnings of Greek Mathematics
CO4	Understand the Euclidean Geometry, Euclid’s Foundation for Geometry, Euclid’s Proof of the Pythagorean Theorem
CO5	Understand Infinity of Primes, Measurement of the Earth , Archimedes, The Ancient World’s Genius, contributions of Hardy and Ramanujan, Examination, The Rejuvenation of English Mathematics

5D01 MAT: History of mathematics

Unit I **(18 hours)**

Early Number Systems and Symbols, Mathematics in Early Civilizations (section 1.2, 1.3, 2.1 to 2.5)

Unit II **(18 hours)**

The Beginnings of Greek Mathematics, The Alexandrian School:Euclid, Hardy and Ramanujan, The Tripos Examination, The Rejuvenation of English Mathematics, A Unique Collaboration: Hardy and Littlewood, India’s Prodigy, Ramanujan (section 3.1, 3.2, 4.1 to 4.5, 13.1)

Text

David M Burton, The History of Mathematics – An Introduction, Seventh Edition, Mc Graw Hill.

References

1. Luke Hodgkin, A History of Mathematics from Mesopotamia to modernity, Oxford University Press.
2. Katz, Victor J., A History of Mathematics: An Introduction (3^{rd} edition), Addison-Wesley
3. Berlinghoff, William P., and Fernando Q. Gouvêa, Math Through the Ages: A Gentle History for Teachers and Others, Expanded Edition, Oxton House and MAA

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	17	**20**
II	16	
Total	**33**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	• ***Answer any 4 questions***	(4 *questions x Mark 1each* = *4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	• ***Answer any 6 questions***	*(6 questions x Marks 2 each=12)*
Part C -	**Essay**	(2 questions x Marks 4 each = 8)
	• ***Answer any 1 question***	*(1question x Marks 4 each=4)*

GENERIC ELECTIVE COURSE 2:

QUANTITATIVE ARITHMETIC AND REASONING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5D02 MAT	2	2	2	20	5	25

COURSE OUTCOMES

CO1	Understand average, Problems on ages, Profit and loss and solves problems
CO2	Understand Profit and loss, Ratio and proportion, Chain rule
CO3	Comprehend Time and work, Time and distance and solves problems
CO4	Comprehend Problems on trains, Boats and streams, Calendar, Clocks

5D02 MAT: Quantitative Arithmetic and Reasoning

Unit I **(18 hours)**

Average, Problems on ages, Profit and loss, Ratio and proportion, Chain rule (Chapters 6, 8, 11, 12, 14 of the Text).

Unit II **(18 hours)**

Time and work, Time and distance, Problems on trains, Boats and streams, Calendar, Clocks (Chapters 15, 17, 18, 19, 27, 28 of the Text).

Text

R.S. Aggarwal, Quantitative Aptitude for Competitive Examinations, S. Chand.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	17	**20**
II	16	
Total	**33**	

Pattern of Question Paper

Part A -	**Short answer**	(5 questions x Mark 1each = 5)
	- ***Answer any 4 questions***	(4 *questions x Mark 1each = 4*)
Part B -	**Short Essay**	(10 questions x Marks 2 each = 20)
	- ***Answer any 6 questions***	*(6 questions x Marks 2 each=12)*
Part C -	**Essay**	(2 questions x Marks 4 each = 8)
	- ***Answer any 1 question***	*(1question x Marks 4 each=4)*

- **Use of Calculators shall *not* be permitted for this course.**

GENERIC ELECTIVE COURSE 3:

LINEAR PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5D03 MAT	2	2	2	20	5	25

COURSE OUTCOMES

CO1	Understand General linear programming problem – canonical and standard forms of L.P.P, Solutions and fundamental properties of solutions of LPP.
CO2	Understand Graphical solution method, Simplex method, Duality in linear programming, Formulating a dual problem.
CO3	Understand General transportation problem, the transportation tables, Loops in transportation table and solves transportation problem
CO4	Understand Degeneracy in transportation problem, Transportation algorithm (MODI method) and solves problems

5D03 MAT: Linear Programming

Unit I - Linear programming (20 hours)

Formulation of LPP from daily life situations (simple cases only and there should not be any question from this topic in the End Semester Examination). General linear programming problem – canonical and standard forms of L.P.P, Graphical solution method, Simplex method. (Sections 2.1, 2.2, relevant topics from 2.3 and 2.4, 3.2, 3.4, 3.5, 4.1, 4.3 of the Text. Proofs of all theorems are omitted).

Unit II - Transportation problems (16 hours)

General transportation problem, the transportation tables, Loops in transportation table, Solution of a transportation problem, Finding an initial basic feasible solution, Degeneracy in transportation problem, Transportation algorithm (MODI method). (Sections 10.1, 10.2, 10.5, 10.6, 10.9, 10.12, 10.13of the Text. Proofs of all theorems are omitted)

Text

K. Swarup, P.K. Gupta and M. Mohan, Operations Research (18th edition), Sulthan Chand and Sons.

References

1. J. K. Sharma, Operations Research Theory and Applications. McMillan
2. G. Hadley, Linear Programming, Oxford & IBH Publishing Company
3. H. A. Thaha, Operations Research, An Introduction (8th edition), Prentice Hall

Marks including choice

Unit	Marks in End Semester Examination	
	Aggregate Marks	**Maximum Marks**
I	17	**20**
II	16	
Total	**33**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions* x *Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)

- ***Answer any 6 questions*** *(6 questions* x *Marks 2 each=12)*

Part C - **Essay** (2 questions x Marks 4 each = 8)

- ***Answer any 1 question*** *(1question* x *Marks 4 each=4).*

- **Use of Scientific Calculators below 100 functions (that is, upto fx 99) shall be permitted for this courses.**

GENERIC ELECTIVE COURSE 4:

GRAPH THEORY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5D04 MAT	2	2	2	20	5	25

COURSE OUTCOMES

CO1	Understand how to transform daily life problems into Graph Theoretical (Mathematical) Models
CO2	Understand the evolution of Graph Theory as a subject
CO3	Understand the representation of Chinese Postman Problem, Marriage Problem, Travelling Salesman Problem and Personnel Assignment Problem
CO4	Understand the concepts of planar graphs and Jordan curve
CO5	Comprehend Problem of colouring maps and Graph Colouring

5D04 MAT: Graph Theory

Unit I **(18 hours)**

1. Representing a telephone network so as to identify vulnerability to accidental disruption
2. Representing a set of jobs and a set of people so as to assign jobs to qualified persons
3. Representing a salesman’s destinations in such a way that a shortest round trip through all destinations can be found out
4. Representing supply lines of electricity, gas and water so that each house gets the supply and the lines do not cross

5. Representing radio frequencies to assign frequencies to radio or TV broadcasting companies so that the frequencies do not interfere with each other
6. Representing the air route between cities so as to find out the cheapest route between cities
7. Konigsberg bridge problem
8. Checking whether it is possible to draw a closed figure without lifting pencil from the paper – Euler graph
9. Finding the shortest path for a postman to start from his Post Office, deliver the letters and return to the Post Office – Chinese Postman Problem.

(Relevant portions from sections 1.2, 3.1, 3.2)

Unit II **(18 hours)**

10. Finding the path of minimum total distance for a travelling salesman involving a number of towns – Travelling Salesman Problem
11. Representing the problem of getting a set of boys married with a set of girls in such a way that a boy is married to his girlfriend – Marriage problem
12. Representing the problem of assigning qualified teachers to a set of classes – Personnel Assignment Problem
13. The problem whether we can join points inside a continuous non self intersecting curve whose origin and terminus coincide with a point exterior to it – Jordan curve theorem
14. The fact that there are only five regular polyhedra
15. The problem of colouring maps – Graph Colouring
16. Representing the streets of a city in such a way that one can drive from any part of the city to any other part

(Relevant portions from Sections 3.4, 4.2, 4.3, 5.1, 5.3, 6.1, 6.6, 7.4 of the Text)

(Necessary concepts may be introduced by the teacher to supplement the content. However, Theorems and their proofs are not included in the syllabus. The syllabus is meant only to give an idea of the applications of the subject Graph Theory in real life problems).

Text

A First Look at Graph Theory, John Clark and Derek Allan Holton, Allied Pub., 1995

References

1. R. Balakrishnan and K. Ranganathan, A Text Book of Graph Theory (2nd edition), Springer.

2. J.A. Bondy and U.S.R. Murthy, Graph Theory with Aplications, Macmillan
3. F. Harary, Graph Theory, Narosa
4. K.R. Parthasarathy, Basic Graph Theory, Tata-McGraw Hill.
5. G. Chartrand and P. Zhang, Introduction to Graph Theory, Tata McGraw Hill.

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	17	**25**
II	16	
Total	**33**	

Pattern of Question Paper

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions x Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)

- ***Answer any 6 questions*** *(6 questions x Marks 2 each=12)*

Part C - **Essay** (2 questions x Marks 4 each = 8)

- ***Answer any 1 question*** *(1question x Marks 4 each=4).*

GENERIC ELECTIVE COURSE 5:
BUSINESS MATHEMATICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
					END SEM EXAM	INTERNAL	TOTAL
V	5D05 MAT	2	2	2	20	5	25

COURSE OUTCOMES

CO1	Understand the concept of Limit and continuity, methods of finding limits definition, Differentiation- rules of differentiation, Parametric function logarithmic differentiation.
CO2	Understand the Successive differentiation, Local maximum and local minimum and solves problems
CO3	Understand the Rules of integration, Some standard results, Consumer's surplus, Producer's surplus, Consumer's surplus
CO4	Understand rate of interest, Continuous compounding, Compound interest, Present valve, interest and discount, Rate of discount, Equation of value, Depreciation and solves problems

5D05 MAT: Business Mathematics

Unit I **(18 hours)**

Functions, Limit and continuity: Constants and variables, functions, Limit of a function, methods of finding limits definition, Differentiation- rules of differentiation, Parametric function logarithmic differentiation, Successive differentiation, Local maximum and local minimum, (except concavity, convexity and points of inflexion), solved examples. (Sections 3.1 to 3.2, 3.6, 4.1, 4 .3, 4.4, 4.7,4.8, 5.2,5.3)

Unit II **(18 hours)**

Integral Calculus: Rules of integration, Some standard results, Consumer's surplus, Producer's surplus, Consumer's surplus under pure competition, Consumer's surplus under monopoly. Nominal rate of interest, Effective rate of interest, Continuous compounding, Compound interest, Present valve, interest and discount, Rate of discount, Equation of value, Depreciation. (Sections 6.1 to 6.2, 6.4, 7.2to 7.5, 8.1 to 8.9)

Text

B. M. Aggarwal, Business Mathematics and Statistics, Ane Books Pvt. Ltd.

References

1. A. C. Chiang and K. Wainwright, Fundamental Methods of Mathematical Economics
2. Knut Sydestar and Peter Hummond with Arne Storm, Essential Mathematics for Economic Analysis, Fourth Edition, Pearson

Marks including choice

Unit	**Marks in End Semester Examination**	
	Aggregate Marks	**Maximum Marks**
I	17	**20**
II	16	
Total	**33**	

Part A - **Short answer** (5 questions x Mark 1each = 5)

- ***Answer any 4 questions*** (4 *questions* x *Mark 1each = 4*)

Part B - **Short Essay** (10 questions x Marks 2 each = 20)

- ***Answer any 6 questions*** *(6 questions* x *Marks 2 each=12)*

Part C - **Essay** (2 questions x Marks 4 each = 8)

- ***Answer any 1 question*** *(1question* x *Marks 4 each=4).*

- **Use of Scientific Calculators below 100 functions (that is, upto fx 99) shall be permitted for this course.**

KANNUR UNIVERSITY

(Abstract)

B.Sc. Physics Programme-Scheme, Syllabus and Pattern of Question Papers of Core, Complementary Elective and Generic Elective Course under Choice Based Credit and Semester System (Outcome Based Education System-OBE) in Affiliated colleges with effect from 2019 Admission-Implemented-Orders issued.

Academic Branch

No.Acad.C2/12291/2019 Dated, Civil Station P.O 21/ 06/ 2019

Read:- 1. U.O.No.Acad.C2/429/2017 dated 10-10-2017
2. The Minutes of the Meeting of the Curriculum Restructuring Committee held on 28-12-2018.
3. U.O No. Acad.C2/429/2017 Vol.II dated 03-06-2019
4. The Minutes of the Meeting of the Board of Studies in Physics(UG) held on 06/06/2019
5. Syllabus of B.Sc Physics Programme Submitted by the Chairperson, Board of Studies in Physics (UG) dated 12.06.2019

ORDER

1. A Curriculum Restructuring Committee was constituted in the University vide the paper read (1) above to co-ordinate the activities of the Syllabus Revision of UG Programmes in Affiliated colleges of the University.

2. The meeting of the Members of the Curriculum Restructuring Committee and the Chairpersons of different Boards of Studies held, vide the paper read (2) above, proposed the different phases of Syllabus Revision processes such as conducting the meeting of various Boards of Studies and Workshops, discussion etc.

3. The Revised Regulation for UG Programmes in Affiliated colleges under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) was implemented with effect from 2019 Admission as per paper read (3) above.

4. Subsequently ,as per paper read (4) above, the Board of Studies in Physics (UG) finalized the Scheme, Syllabus & Pattern of Question Paper for Core, Complementary Elective & Generic Elective Course of B.Sc. Physics Programme to be implemented with effect from 2019 Admission.

5. As per paper read (5) above, the Chairperson, Board of Studies in Physics (UG) submitted the finalized copy of the Scheme, Syllabus & Pattern of Question Papers ofB.Sc. Physics Programme for implementation with effect from 2019 Admission.

6. The Vice Chancellor after considering the matter in detail and in exercise of the powers of the Academic Council conferred under Section 11(1) of Kannur University Act 1996 and all other enabling provisions read together with accorded sanction to implement the Scheme, Syllabus & Pattern of Question Paper(Core/Complementary Elective/Generic Elective Course) of B.Sc. Physics Programme under Choice Based Credit and Semester System(in OBE-Outcome Based Education System) in the Affiliated colleges under the University with effect from 2019 Admission, subject to reporting to the Academic Council.

7. The Scheme, Syllabus & Pattern of Question Paper of B.Sc. Physics Programme are uploaded in the University website (www.kannuruniversity.ac.in)

Orders are issued accordingly.

Sd/-
DEPUTY REGISTRAR (ACADEMIC)
For REGISTRAR

To

The Principals of Colleges offering B.Sc. Physics programme

Copy to:-
1. The Examination Branch (through PA to CE)
2. The Chairperson, Board of Studies in B.Sc. Physics (UG)
3. PS to VC/PA to PVC/PA to Registrar
4. DR/AR-I, Academic
5. The Computer Programmer(for uploading in the website)
6. SF/DF/FC

Forwarded/By Order

SECTION OFFICER

KANNUR UNIVERSITY

BOARD OF STUDIES -PHYSICS (UG)

SYLLABUS FOR PHYSICS CORE, COMPLEMENTARY ELECTIVE & GENERIC ELECTIVE COURSES OF BSc PROGRAMME

CHOICE BASED CREDIT AND SEMESTER SYSTEM
(OBE – Outcome Based Education – system)

(2019 ADMISSION ONWARDS-)

KANNUR UNIVERSITY

VISION AND MISSION STATEMENTS

Vision: To establish a teaching, residential and affiliating University and to provide equitable and just access to quality higher education involving the generation, dissemination and a critical application of knowledge with special focus on the development of higher education in Kasargode and Kannur Revenue Districts and the Manandavady Taluk of Wayanad Revenue District.

Mission:

- To produce and disseminate new knowledge and to find novel avenues for application of such knowledge.
- To adopt critical pedagogic practices which uphold scientific temper, the uncompromised spirit of enquiry and the right to dissent.
- To uphold democratic, multicultural, secular, environmental and gender sensitive values as the foundational principles of higher educationand to cater to the modern notions of equity, social justice and merit in all educational endeavors.
- To affiliate colleges and other institutions of higher learning and to monitor academic, ethical, administrative and infrastructural standards in such institutions.
- To build stronger community networks based on the values and principles of higher education and to ensure the region’s intellectual integration with national vision and international standards.
- To associate with the local self-governing bodies and other statutory as well as non-governmental organizations for continuing education and also for building public awareness on important social, cultural and other policy issues.

KANNUR UNIVERSITY
PROGRAMME OUTCOMES (PO)

PO 1.Critical Thinking:

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

1.3 Develop self-critical abilities and the ability to view positions, problems and social issues from plural perspectives.

PO 2.Effective Citizenship:

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

PO 3.Effective Communication:

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

PO 4.Interdisciplinarity:

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

PREFACE

The Board of Studies in Physics (UG) strives to offer students with a solid scientific and technical foundation and to promote them to build up vision in tackling problems and seeking solutions through the reformed outcome based curriculum and syllabus. This curriculum and syllabus clearly states the graduate attributes/outcomes and is developed after numerous workshops and discussions with different stakeholders.

The B.Sc. Physics degree course will open up exciting higher studies/employment opportunities for students. The course offers essential knowledge in theoretical Physics as well as practical knowledge to the students to apply it in real-life state of affairs. B.Sc. Physics aspirant needs to have basic knowledge in mathematical tools and techniques to pursue various courses in this programme.

The teachers should place much greater emphasis on supporting curricular activities aimed for achieving the desired attributes and programme outcomes, even if these are not part of the end semester examinations. Rote learning should be discouraged. The act of seeking new information and creation of new knowledge should be encouraged.

Appropriate three-day induction programmes/bridge courses can be offered to the first year B.Sc. Physics students to cope with the UG programme in Physics. The concerned Department/Institution has a flexibility to frame/adopt the bridge courses by adjusting the teaching hours accordingly.

The Board of Studies in Physics (UG) considered the introduction of outcome based curriculum and syllabus in affiliated colleges for the UG programme in Physics and resolved to implement the same from 2019 admission onwards.

Sheela M Joseph
Chairperson
Board of Studies,Physics (UG)
Kannur University

Kannur University
Programme Specific Outcome of BSc Physics Programme

PSO1: Understand and apply the principles of Classical mechanics, Quantum mechanics, Thermodynamics, Nuclear physics and Electrodynamics

PSO 2: Understand and apply the principles of Solid state physics, Optics, Photonics and Spectroscopy

PSO 3: Understand the principles of Electronics, Design and test electronic circuits

PSO 4: Understand and apply the principles of Mathematical Physics and Computational Physics and do Error analysis in measurements

INDEX

KANNUR UNIVERSITY BSc PHYSICS PROGRAMME

WORK AND CREDIT DISTRIBUTION STATEMENT

(BSc:Common English: 22, Additional Common: 16, Core: 56,

First complementary Elective: 12,Second complementary Elective:12, Generic Elective: 2)

Semester	Course Title*	Credits	Hours per week	Total Credits	Total Hours
I	Common Course(English)I	4	5	18	25
	Common Course(English)II	3	4		
	Common Course (Addl Lang) VII	4	4		
	Core Course(Theory 1B01PHY)	2	2		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths I	3	4		
	Second Complementary Elective Theory I	2	2		
	Second Complementary Elective Practical I *	-	2		
II	Common Course(English)III	4	5	18	25
	Common Course(English)IV	3	4		
	Common Course (Addl Lang) VIII	4	4		
	Core Course(Theory 2B02PHY)	2	2		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths II	3	4		
	Second Complementary Elective Theory II	2	2		
	Second Complementary Elective Practical I *	-	2		
III	Common Course(English)V	4	5	16	25
	Common Course (Addl Lang) IX	4	5		
	Core Course(Theory 3B03PHY)	3	3		
	Core Course(Practical 4B05PHY*)	-	2		
	First Complementary Elective Theory Maths III	3	5		
	Second Complementary Elective Theory III	2	3		
	Second Complementary Elective Practical I *	-	2		
IV	Common Course(English)VI	4	5	24	25
	Common Course (Addl Lang) X	4	5		
	Core Course(Theory 4B04PHY)	3	3		
	Core Course(Practical 4B05PHY)	4	2		
	First Complementary Elective Theory Maths IV	3	5		
	Second Complementary Elective Theory IV	2	3		
	Second Complementary Elective Practical I	4	2		

V	Generic Elective Course!!	2	2	17	25
	Core Course (Theory-5B06PHY)	4	4		
	Core Course (Theory-5B07PHY)	4	4		
	Core Course (Theory-5B08PHY)	4	4		
	Core Course (Theory-5B09PHY)	3	3		
	Core Course (Practical II-6B15PHY**)	-	4		
	Core Course (Practical III 6B16PHY**)	-	4		
VI	Core Course (Theory-6B10PHY)	4	4	27	25
	Core Course (Theory-6B11PHY)	4	4		
	Core Course (Theory-6B12PHY)	4	4		
	Core Course (Theory-6B13PHY)	3	3		
	Discipline Specific elective 6B14PHY)	2	2		
	Core Course (Practical II-6B15PHY)	4	4		
	Core Course (Practical III 6B16PHY)	4	4		
	Project&Study Tour*** 6B17PHY	2	-		
Total				120	150

* External examination will be conducted at the end of Fourth Semester
** External examination will be conducted at the end of Sixth Semester
*** Study tour report (Industrial visit/ Scientific Institution visit) should be submitted along with the project report
!!Generic elective courses offered by Physics is shown in PART C

First Complementary Elective (Compulsory): Mathematics

Second Complementary Elective: Chemistry/ Electronics/ Computer Science

PART A:
PHYSICS CORE COURSES
WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

course code	Course title	Sem	Hours per week	Credit	Exam hours	Marks		
						CE	ESE	Total
1B01PHY	MECHANICS I	I	2	2	3	10	40	50
2B02PHY	MATHEMATICAL PHYSICS AND ERROR ANALYSIS	II	2	2	3	10	40	50
3B03PHY	MECHANICS II	III	3	3	3	10	40	50
4B04PHY	ELECTRONICS I	IV	3	3	3	10	40	50
4B05PHY	GENERAL PHYSICS PRACTICAL I*	IV	2	4	3	10	40	50
5B06PHY	QUANTUM MECHANICS	V	4	4	3	10	40	50
5B07PHY	ELECTROSTATICS AND MAGNETOSTATICS	V	4	4	3	10	40	50
5B08PHY	THERMODYNAMICS AND STATISTICAL MECHANICS	V	4	4	3	10	40	50
5B09PHY	ELECTRONICS II	V	3	3	3	10	40	50
6B10PHY	SOLID STATE PHYSICS AND SPECTROSCOPY	VI	4	4	3	10	40	50
6B11PHY	OPTICS AND PHOTONICS	VI	4	4	3	10	40	50
6B12PHY	NUCLEAR, PARTICLE & ASTROPHYSICS	VI	4	4	3	10	40	50
6B13PHY	ELECTRODYNAMICS AND CIRCUIT THEORY	VI	3	3	3	10	40	50
6B14PHY	DISCIPLINE SPECIFIC ELECTIVE !	VI	2	2	3	10	40	50
6B15PHY	GENERAL PHYSICS PRACTICAL II**	VI	4	4	3	10	40	50
6B16PHY	ELECTRONICS PRACTICAL III**	VI	4	4	3	10	40	50
6B17PHY	PROJECT*** &STUDY TOUR	VI	-	2	-	5	20	25

*****External examination will be conducted at the end of Fourth Semester
** External examination will be conducted at the end of Sixth Semester
***External examination will be conducted at the end of Sixth Semester.

Study tour report (Industrial visit/ Scientific Institution visit) should be submitted along with the project report.
!Options available are listed in table I

Table I

COURSE CODE	COURSE TITLE
6B14 PHY(1)	**PYTHON PROGRAMMING**
6B14 PHY(2)	**NANOSCIENCE**
6B14 PHY(3)	**MATERIAL SCIENCE**
6B14 PHY(4)	**COSMOLOGY**
6B14 PHY(5)	**PLASMA PHYSICS**

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

CONTINUOUS INTERNAL ASSESSMENT-THEORY

COMPONENT	WEIGHTAGE	REMARKS
COMPONENT 1 Test paper	60%	Best of two
COMPONENT 2 Open book problem solving/Seminar/Viva	40%	One

CONTINUOUS INTERNAL ASSESSMENT- PRACTICAL

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT 1 Lab Skill	25%	
COMPONENT 2 Punctuality	25%	
COMPONENT 3 Record	25%	A logbook of practicals should be maintained which must include theory,observation,tabulation,calculation ,graph ,result etc
COMPONENT 4 Examination	25%	A model exam should be conducted before external examination & considered for internals

CONTINUOUS INTERNAL ASSESSMENT- PROJECT

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT 1 Topic	20%	Relevance of topic
COMPONENT 2 Punctuality	20%	
COMPONENT 3 Scheme & report	20%	
COMPONENT 4 Viva-voce	20%	
COMPONENT 5 Study tour report	20%	Industrial visit/ Scientific Institution visit

CORE COURSE I: MECHANICS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	1B01PHY	2	2	3

COURSE OUTCOME

CO 1: Understand Newton's laws of motion, the concepts of linear and angular momentum and torque

CO2: Determine the Centre mass of a given configuration

CO3: Understand the principle of work, energy and power

CO4: Determine angular momentum of a body about any given axis

Unit I – Newton's Laws-The foundations of Classical Mechanics 12Hrs

Newton's First Law, Second Law and Third Law – Astronauts in space-Standards and units – Some applications of Newton's laws-Astronauts tug of war-freight train-constraints-block on string – The everyday forces of physics-turtle in an elevator-block and string-dangling rope-block and wedge with friction-spring and block-spring gun-Illustration of initial conditions – Dynamics of a system of particles – The Bola – Centre of mass – Drum major's baton – Centre of mass motion– Conservation of momentum – Spring Gun recoil

[**Book of Study**, **sections 2.1 – 2.5, 3.1 – 3.3**]

Unit II – Work and Energy 10 Hrs

Integrating the equation of motion in one dimension – Mass thrown upward in a uniform gravitational field; Solving the equation of simple harmonic motion – Work-energy theorem in one dimension – Vertical motion in an inverse square filed – Integrating the equation of motion in several dimensions – Work-energy theorem –; Escape velocity – Applying the work-energy theorem – Work done by a uniform force; Work done by a central force;Potential energy – Potential energy of a uniform force field; Potential energy of an inverse square force – What potential energy tells us about force – Stability – Energy diagrams – Small oscillations in a bound system – Molecular vibrations – Nonconservative forces – General law of conservation of energy – Power -conservation laws & particle collisions[**Book of Study**, **sections 4.1 – 4.14**].

Unit III – Angular Momentum 10Hrs

Angular momentum of a particle – Angular momentum of a sliding block; – Torque – Central force motion and the law of equal areas – Torque ona sliding block; Torque due to gravity – Angular momentum and fixed axis rotation – Moments of inertia of some simple objects – The parallel axis theorem– Dynamics of pure rotation about an axis – Atwood's machine with a massive pulley – The simple pendulum – The physical pendulum – Motion involving both translation and rotation –Angular momentum of a rolling wheel – Drum rolling down a plane – Work-energy theorem fora rigid body –

Drum rolling down a plane : energy method – The vector nature of angular velocity and angular momentum – Rotation through finite angles – Rotation in the xy-plane –Vector nature of angular velocity – Conservation of angular momentum

[**Book of Study**, **sections6.1 – 6.7, 7.1 -7.2, 7.5]**

Book of Study:

1. An Introduction to Mechanics, 1st Edn. – Special Edition 2009 .-Daniel Kleppner and Robert J. Kolenkow – McGraw-Hill

Books for Reference :

1. Berkeley Physics Course : Vol.1 : Mechanics, 2nd Edn. – Kittel *et al.* – McGraw-Hill
2. Fundamentals of Physics by Resnick and Halliday

MARKS INCLUDING CHOICE

Unit	**Marks**
I	22
II	18
III	20

PATTERN OF QUESTIONS

Part A	**Short answer**	**(6 questions x Mark 1 = 6)**
	Answer all questions	**(6 questions x Mark 1 = 6)**
Part B	**Short Essay**	**(8 questions x Marks 2 each =16)**
	Answer any 6 questions	**(6questions x Marks 2 each=12)**
Part C	**Problems**	**(6 questions x Marks 3 each =18)**
	Answer any 4 questions	**(4 questions x Marks 3 each=12)**
Part D	**Long Essay**	**(4 questions x Marks 5 each =20)**
	Answer any 2 questions	**(2 questions x Marks 5 each=10)**
	• **Total marks including choice -60** • **Maximum marks of the course-40**	

CORE COURSE II:MATHEMATICALPHYSICS AND ERROR ANALYSIS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2B02PHY	2	2	3

COURSE OUTCOME

CO 1: Understand vector operations and vector algebra
CO2: Determine derivative and integral of various functions
CO3: State fundamental theorems of calculus
CO4: Compare differential operators in various coordinate systems
CO5: Understand the basic concepts of modeling
CO6: Solve first order and second order ODEs
CO7: Estimate uncertainties in measured values

Unit I– Vector Calculus 10 Hrs

Vector Algebra: Vector operations-Vector algebra: Component form–Triple products–Position, Displacement and Separation vectors

Differential Calculus:"Ordinary "derivatives–Gradient–The Del operator–Divergence–Curl–Product rules– Second derivatives

Integral Calculus: Line integral, surface integral and volume integral–Fundamental theorem ofcalculus–Fundamental theorem for Gradients–Fundamental theorem for divergences: Gauss'sDivergenceTheorem(no proof needed)–Fundamental theorem for curls:Stoke's theorem(no proof needed)—Divergence-less vector fields–Curl-less vector fields– Potentials. **[Book I sections1.1,1.2,1.3,1.6]**

UnitII Curvilinear co-ordinates 5Hrs

Spherical polar coordinates–Cylindrical coordinates–Their relationship to Cartesian coordinates–Expressing differential displacement vector, differential area vectors, differential volume element,gradientoperator,divergence operator and curl operator in spherical polar and cylindrical coordinates. **[Book I section 1.4]**

Unit III– Differential Equation 9Hrs

Basic concepts-modeling-geometric meaning-direction field –Euler's method-separable ODE-modeling-exact ODE-integrating factors –linear ODEs –Bernoulli equation-

Population dynamics

Homogenous linear ODEs of second order-homogenous linear ODEs with constant coefficients-modeling of free oscillations of mass spring system

[BookII sections 1.1-1.5,2.1-2.2,2.4]

Unit IV– Error Analysis 8 Hrs.

Propagation of Uncertainties-uncertainities in direct measurement- Square root rule for counting experiments, Sums and differences, products and quotients, special cases – measured quantity times exact number, power, arbitrary function of one variable, Example-simple pendulum, General formula for error propagation.-Random and systematic errors, mean and standard deviation, standard deviation as uncertainty, standard deviation of the mean, examples, systematic errors

[Book III sections 3.1-3.4, 3.8, 3.9, 3.11, 4.1- 4.6]

Book of Study :

1. Electrodynamics – DavidGriffiths
2. AdvancedEngineering Mathematics, 10th Edn.– ErwinKreyszig– John Wliey&sons
3. AnIntroduction to Error Analysis, J R Taylor, (University Science Books).

Books for Reference :

1. AfirstcourseinDifferentialequationswithapplications–A.H.Siddiqui,P.Manchanda–Macmillan IndiaLtd
2. Mathematical Methods for PhysicsandEngineering, 3rdEdn.–K. F.Riley, M. P.Hobson, S. J.Bence

MARKS INCLUDING CHOICE

Unit	Marks
I	18
II	12
III	18
IV	12

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	• **Total marks including choice -60** • **Maximum marks of the course-40**	

CORE COURSE III: MECHANICS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	**3B03PHY**	**3**	**3**	**3**

COURSE OUTCOME

CO1: Understand the concept of Galilean transformations and uniformly accelerating systems

CO2: Determine the trajectory of a body in central force problem using Newton's laws

CO3: Understand Kepler's laws of planetary motion

CO4: Formulate the mathematical equation of waves

CO5: Understand the concept and consequences of special theory of relativity

Unit I – Noninertial Systems and Fictitious Forces 7Hrs

Galilean transformations – Uniformly accelerating systems – The apparent force of gravity –Pendulum in an accelerating car – The principle of equivalence –Physics in a rotating coordinate system – Time derivatives and rotating coordinates –Acceleration relative to rotating coordinates – The apparent force in a rotating coordinate system– The Coriolis force – Deflection of a falling mass – Motion on the rotating earth

[Book1 sections 8.1 – 8.5]

Unit II – Central Force Motion 9 Hrs

Central force motion as a one-body problem – General properties of central force motion –Motion is confined to a plane – Energy and angular momentum are constants of the motion –The law of equal areas – Finding the motion in real problems – The energy equation and energy diagrams – Noninteracting particles – Planetary motion – Hyperbolic orbits – Satellite orbit –Kepler's laws – The law of periods – Properties of the ellipse **[Book1 sections 9.1 – 9.7]**

Unit III – Harmonic Oscillator 8 Hrs

Introduction and review – Standard form of the solution – Nomenclature – Initial conditions and the frictionless harmonic oscillator – Energy considerations – Time average values – Average energy – Damped harmonic oscillator – Energy and Q-factor – –Graphical analysis of a damped oscillator – Solution of the equation of motion for the damped oscillator – Forced harmonic oscillator – Undamped forced oscillator – Resonance **[Book 1 sections 10.1 – 10.3]**

Unit IV-Waves **6Hrs**

Waves-Progressive wave-General equation of wave motion- plane progressive harmonic wave-Energy density-Transverse waves in stretched strings-longitudinal waves in rodslongitudinal waves in gases-Fouriers theorem-mathematical expression-conditions **(Book 2 11.1-11.9,11.12)**

Unit V–Special Theory of Relativity **18 Hrs**

Classical relativity-,Michelson –Morley experiment,Einstein's postulates-consequences of Einstein's postulates-relativity of time-relativity of length-relativistic velocity addition-relativistic Doppler effect, Lorentz transformation-length contraction-velocity transformation-simultaneity and clock synchronization-twin paradox-space time diagram-relativistic dynamics-relativistic kinetic energy-relativistic total energy and kinetic energy–conservation laws in relativistic decay and collision,experimental tests of special relativity-universality of speed of light-time dialation- Doppler effect-relativistic momentum and energy-twin paradox

(Book 3 Sections 2.1-2.9)

Books of Study :

1. An Introduction to Mechanics, 1stEdn. – Daniel Kleppner and Robert J. Kolenkow – McGraw- Hill
2. Mechanics by J C Upadhyaya 5thedn.
3. Modern Physics by Kenneth S Krane, 2ndedn.

Books for Reference:

1. Berkeley Physics Course : Vol.1 : Mechanics, 2ndEdn. – Kittel*et al.* – McGraw-Hill

MARKS INCLUDING CHOICE

Unit	**Marks**
I	8
II	10
III	10
IV	8
V	24

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problems**	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	• **Total marks including choice -60** • **Maximum marks of the course-40**	

CORE COURSE IV: ELECTRONICS I

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B04PHY	3	3	3

COURSE OUTCOME

CO 1: Understand the basics of PN junction diode, Zener diode and their applications

CO2: Understand the structure, operations and characteristics of BJT and FET

CO3 :Understand the biasing methods and design of BJT and FET circuits

CO4: Understand the different number systems, conversions and binary arithmetic operations

CO5 : Understand the basic combinational logic gates

CO6 : Understand the Boolean algebra &logic simplification using Boolean algebra

Unit I : Semiconductor Diodes and their Applications 8 Hrs.

PN junction diode, Characteristics and parameters, Diode approximations, DC load line analysis, Zener diodes, Half wave rectification, Full wave rectification, Half wave rectifier power supply, Full wave rectifier power supply, Zener diode voltage regulators. **(Book 1, Sections 2.1-2.4, 2.9, 3.1-3.4, 3.7)**

Unit II: Bipolar Junction Transistors and their Biasing 12 Hrs.

BJT Operation, BJT Voltages and Currents, BJT amplification, Common Base Characteristics, Common Emitter Characteristics, Common Collector Characteristics, DC Load line and Bias point, Base bias, Collector to base bias, Voltage divider bias, Comparison of basic bias circuits, Bias circuit design, Thermal stability of bias circuits, Switching circuits. **(Book 1, Sections 4.1-4.3, 4.5-4.7, 5.1-5.5, 5.7, 5.9, 5.10)**

Unit III: Field Effect Transistors and their Biasing 10 Hrs

Junction field effect transistors, JFET characteristics, JFET Parameters, DC load line and bias point, Gate bias, Self bias and Voltage divider bias, Comparison of basic JFET bias circuits, MOSFET, Types of MOSFETs, D-MOSFET – Symbol, Circuit operation, Transfer Characteristics; E-MOSFET.

. **(Book 1, Sections 9.1-9.3, 10.1-10.5; Book 2, Sections 19.27-19.31, 19.36)**

Unit IV: Number Systems, Operations and Codes 8 Hrs.

Binary numbers, Decimal to Binary Conversion, Binary Arithmetic, 1’s and 2’s Complements of Binary Numbers, Signed Numbers, Arithmetic Operations with Signed

Numbers, Hexadecimal Numbers, Octal Numbers, Binary Coded Decimals, Gray code, ASCII code. **(Book 3, Sections 2.2-2.11**)

Unit V: Logic gates, Boolean Algebra and Logic Simplification 10 Hrs

The inverter, AND, OR, NAND, NOR, Exclusive- OR and Exclusive - NOR Gates, Boolean Operations and Expressions, Laws and rules of Boolean Algebra, DeMorgan's Theorems, Boolean Analysis of Logic circuits, Simplification using Boolean Algebra, Basic combinational Logic circuits, The universal property of NAND and NOR gates, Combinational logic using NAND and NOR gates.

. **(Book 3, Sections 3.1-3.6, 4.1-4.5, 5.1, 5.3, 5.4)**

Books for Study:

1.Electronic Devices and Circuits - 5th Edition, David A Bell (Oxford University Press)
2. Principles of Electronics - 11th Edition, V K Mehta & Rohit Mehta (S Chand & Co.)
3. Digital Fundamentals - 10th Edition, Thomas L. Floyd (Pearson Education)

Books for Reference:

1.Electronic Devices and circuit theory - Robert L Boylestad & Louis Nashelsky (Pearson Eduaction)
2. Electronic Principles - A P Malvino (TMH)
3. Electronic Devices and circuits -Theodore F Bogart, Jeffrey S. Beasley & Guilermo Rico (Pearson)
4.The Art of Electronics - Paul Horowitz and Winfield Hill (Cambridge University Press)
5. Digital Principles and Applications - D P Leach and A P Malvino (TMH)
6. Fundamentals of Digital Ciruits - A Anandakumar (PHI)

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	10
II	16
III	12
IV	10
V	12

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
• **Total marks including choice -60** • **Maximum marks of the course-40**		

CORE COURSE V: - GENERAL PHYSICS PRACTICAL I

BASIC EXPERIMENTS IN PROPERTIES OF MATTER, OPTICS, ELECTRICITY &MAGNETISM

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	4B05PHY	2	4	3

COURSE OUTCOME

CO1: Familiarize with apparatus for mechanical, electrical, magnetic and optical experiments.

CO2: Develop skill in setting up of apparatus for accurate measurement of physical quantities.

CO3: Understand multiple experimental techniques for determining physical quantities.

CO4: Develop skill in systematic way of measurements by minimizing possible errors.

CO5: Develop skill to analyze by plotting graphs using software.

CO6: Develop skill for systematic trouble shooting.

CO7: Perform error analysis for experiments.

Note: A brief theoretical background of each experiment must be given to the students before each cycle of experiments and assess it. Students have to maintain a practical log book regularly signed by the teacher in charge and should be submitted at the time of University Examination. Fair record is not required. All the 20 experiments have to be performed.

1. Flywheel- Moment of inertia
2. Torsion pendulum- Moment of inertia of a disc and rigidity modulus (using two identical masses)

3. Compound pendulum- To find ‘g’ and radius of gyration
4. Young’s modulus of the material of bar-Non-uniform bending using pin & microscope
5. Young’s modulus of the material of bar -Uniform Bending using optic lever
6. Surface Tension by capillary rise method
7. Coefficient of viscosity –Poiseuille’s formula (by measuring radius of capillary tube using mercury)
8. Rigidity modulus of a material-Static torsion
9. Spectrometer – Refractive index of the material of a prism
10. Spectrometer –Dispersive power of a prism
11. Melde’s String- Frequency of a tuning fork
12. Lee’s disc- Thermal conductivity of a bad conductor
13. Newton’s law of cooling- Specific heat of a liquid
14. Potentiometer- - resistance &resistivity
15. Potentiometer- Calibration of low range voltmeter (null Method)
16. Carey Fosters Bridge- resistance &resistivity
17. Deflection Magnetometer- Tan A , Tan B and Tan C
18. Deflection Magnetometer & Box type vibration magnetometer- m and B0
19. Searle’s Vibration magnetometer- moment and ratio of moments
20. Liquid Lens I –Refractive index of a liquid and material of the lens
    (i) using mercury
    (ii) using another liquid of known refractive index

Reference Books

1. Practical Physics by P R Sasi Kumar PHI Learning Private Limited
2. BSc Practical Physics by C L Arora ,S Chand
3. An advanced course in Practical Physics by D.Chattopadhyay& P C Rakhit New Central Book Agency(P)Ltd

MARKS DISTRIBUTION

Sections	**Marks**
I Principle with theory	10
II Performance	6
III Observation	14
IV Viva to evaluate the skill & knowledge about the experiment	4
V Calculation ,Graph etc	6

CORE COURSE VI: QUANTUM MECHANICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B06PHY	4	4	3

COURSE OUTCOME

CO 1: Understand the limitations of classical mechanics
CO2: Explain Blackbody radiation problem, Photoelectric effect and Compton Effect using quantum theory of radiation
CO3: Understand Rutherford,Bohr atom models and concept of energy and angular momentum quantisation
CO4: Understand de-Broglie hypothesis,concept of wave nature of matter and Heisenberg uncertainty principle
CO5: Determine probability of finding a particle and expectation values of variable using its wave function
CO6: Write and solve Schrodinger equation for simple quantum mechanical systems
CO7: State and explain Pauli's exclusion principle

Unit I – Particle like Properties of Electromagnetic Radiation 12 Hrs

Review of electromagnetic waves – Photoelectric effect – Blackbody radiation – Compton effect – Other photon processes – What is a photon ?

[Book 1 Sections 3.1 to 3.6]

Unit II – Rutherford-Bohr Model of the Atom 10Hrs

Basic properties of atoms – Thomson model – Rutherford nuclear atom – Line spectra – Bohr model – Frank-Hertz experiment – Correspondence principle – Deficiencies of Bohr model **[Book 1Sections 6.1 to 6.8]**

Unit III – Wavelike Properties of Particles 10 Hrs

De Broglie hypothesis – Uncertainty relationships for classical waves – Heisenberg uncertainty relationships – Wave packets – Probability and randomness – Probability amplitude **[Book 1Sections 4.1 to 4.6]**

Unit IV – The Schrodinger Equation 14 Hrs

Justification of the Schrodinger equation – The Schrodinger recipe – Probabilities and normalization – Applications – Free particle, Particle in a box (one dimension), Particle in a box (two dimensions), Simple harmonic oscillator – Time dependence – Potential energy steps and potential energy barriers **[Book 1Sections 5.1 to 5.7]**

Unit V– Hydrogen Atom in Wave Mechanics 12Hrs

Schrodinger equation in spherical coordinates – Hydrogen atom wave functions – Radial probability densities – Angular momentum and probability densities – Intrinsic spin –Stern –Gerlachexpt– Energy levels and spectroscopic notation – Zeeman effect – Fine structure [**Book 1Sections 7.1 to 7.8]**

UnitVI-Many electron atom 6hrs

Electron spin, Pauli's Exclusion principle- many electron atom- Spin orbit coupling- total angular momentum- X-Ray spectra

[Book 2Sections 7.1,7.2,7.4,7.8,7.9,7.10]

Book of study :

1. Modern Physics, 2ndEdn. – Kenneth S. Krane – John Wiley & sons
2. Concepts of Modern Physics ,6thEdn–Arthur Beiser

Books of Reference:

1. Modern Physics, 3rdEdn. – Raymond A. Serway, Clement J. Moses, Curt A. Moyer – Cengage
2. Modern Physics, 2ndEdn – Randy Harris – Pearson
3. Modern Physics for Scientists and Engineers, 2ndEdn. – John R. Taylor, Chris D. Zafiratos, Michael A. Dubson – Prentice-Hall of India Pvt. Ltd.

MARKS INCLUDING CHOICE

Unit	**Marks**
I	12
II	10
III	10
IV	14
V	10
VI	4

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	- **Total marks including choice -60** - **Maximum marks of the course-40**	

CORE COURSE VII: ELECTROSTATICS AND MAGNETOSTATICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	**5B07 PHY**	**4**	**4**	**3**

COURSE OUTCOME

Course Outcomes

CO1: Understand the concept of Electric field, electric potential, magnetic field and magnetic potentials
CO2: Use the principle of superposition and law of Gauss to calculate electric field Intensity
CO3: Determine Electric potential of charge distributions and hence specify electric field intensity
CO4: Understand the basic properties of conductors and capacitors
CO5: Calculate the magnetic fields due to currents using Biot-Savart and Ampere laws.
CO6: Compare Magnetostatics and Electrostatics.
CO7: Understand Diamagnets, Paramagnets and Ferro magnets.

Unit I- Electric field and Electric potential. 16 hrs

Coulomb's law for a group of point charges, Idea of electric field , Electric field for (i) a point charge, (ii) group of point charges,(iii)continuous charge distributions, Electric Field lines, Gauss's law - its differential form and proof using Dirac delta function, Applications of Gauss's Law : E due to (i) a Uniformly charged solid sphere ,(ii) an Infinite plane of uniform charge density, and (iii) Two infinite parallel planes with equal & opposite charge densities. The curl of E . Electric potential V due to (i) a point charge, (ii) a group of point charges, (iii)charge distribution. Relation between E and V in differential and integral form, Poisson's equation and Laplace's equation, Potential inside and outside spherical shell, Electrostatic boundary conditions.

(Book 1, Sections 2.1, 2.2, 1.5.1, 1.52, 1.53, 2.3)

Unit II: Work and Energy in Electrostatics. 6hrs

Work done to move a charge,The energy of a point charge distribution ,The energy of a continuous charge distribution ,Electrostatic energy of a (i)uniformly charged spherical shell and (ii)uniformly charged solid sphere, Comments on electrostatic energy, Capacitors: capacitance of a parallel plate capacitor , work done to charge up a capacitor. **(Book 1, Sections 2.4, 2.5.4)**

Unit III: Electrostatic Fields in Matter. 14 hrs

Induced charges,Faraday cage,Dielectrics :induced dipoles - Alignment of polar molecules,Polarization P, Bound charges, Physical interpretation of bound charges,The field inside a dielectric. Electric displacement vector D, Gauss's law in the presence of a dielectric, A deceptive parallel between E and D, Boundary conditions, Electrical susceptibility,permittivity & dielectric constant, Relation between E,P and D. Forces on dielectrics **(Book 1, Sections 2.5.2, 4.1, 4.2, 4.3, 4.4.1, 4.4.4)**

Unit IV : Magnetostatics. 16hrs

The Lorenz force law, Cyclotron motion, Cycloid motion, Magnetic force on (i)a Line current ,(ii) Surface current & (iii)Volume current, Continuity equation,Steady currents, The Biot Savart law, Magnetic field due to (i) Infinitely long current carrying wire, (ii) circular loop carrying current, The Divergence & Curl of B, Ampere's law, Applications of Ampere's law: (i) B due to a long straight current carrying wire, (ii) Magnetic field of a very long solenoid. Comparison of magnetostatics & electrostatics,Magnetic vector potential,Magnetostatic boundary conditions, Multipole expansion of vector potential , magnetic dipole moment.

(Book 1, Sections 5.1, 5.2, 5.3)

Unit V: Magnetic Fields in Matter: 12hrs

Diamagnets,Paramagnets and Ferromagnets,Torques and forces on magnetic dipoles, Effect of a magnetic field on atomic orbits.Magnetization,The field of a magnetized object,Bound currents and its Physical interpretation.The magnetic field inside matter,The auxiliary field **H**, Amperes law in Magnetized material,Deceptive parallel between **B** and **H**, Magnetostatic Boundary conditions. Linear and Nonlinear Media,magnetic susceptibility and permeability.Ferromagnetism

. **(Book 1, Sections 6.1, 6.2, 6.3, 6.4)**

Book for Study:

1.Introduction to electrodynamics -David .J .Griffiths ,3rd Edn,1999,Prentice Hall of India

Books for Reference:

1.Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol.I, 1991, Oxford Univ. Press.

. 2.Feynman Lectures Vol.2, R.P.Feynman, R.B.Leighton, M.Sands, 2008, Pearson Education

MARKS INCLUDING CHOICE

Unit	**Marks**
I	16
II	6
III	14
IV	14
V	10

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	• **Total marks including choice -60** • **Maximum marks of the course-40**	

CORE COURSE VIII: THERMODYNAMICS AND STATISTICAL MECHANICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	**5 B08PHY**	**4**	**4**	**3**

COURSE OUTCOME

CO 1: Understand the concept of temperature ,the thermodynamic state and equilibrium.
CO2: Explain the first law of thermodynamics through work and heat and its Mathematical Formulation.
CO3: Understand the ideal gas equation and kinetic theory of gases
CO4: Understand the second law of thermodynamics and thermodynamic temperature scale.
CO5: Define entropy and thermodynamic potentials
CO6: Understand the basic concepts of Statistical mechanics

Unit I: **Temperature &Zeroth law of Thermodynamics** **8hrs**

Macroscopic and microscopic point of view- Macroscopic vs. microscopic point of view –scope of Thermodynamics-thermal equilibrium- zeroth law-concept of temperature-thermo meters & measurement of temperature- ideal gas temperature –Celsius temperature scale-Celsius & Fahrenheit temperature scale- thermodynamic equilibrium –equation of state-hydrostatic systems-mathematical theorems -intensive and extensive parameters

(Book 1 sections 1.1 – 1.7,1.10-1.11,1.17,2.1-2.4,2.10)

Unit II: Work, heat and first law of thermodynamics **14 hrs**

Work- Quasistatic process- work in changing volume of a hydrostatic system-PV diagram-hydrostatic work depends on path-calculation of ∫pdv for Quasistatic process-generalized work-composite systems-work & heat-Adiabatic work-internal energy function-mathematical formulation of first law-concept of heat – concept of path and state function -differential form of first law-heat capacity & measurements – sp heat of water: the calorie-equations for a hydrostatic system- heat reservoir- conduction-convection-radiation- Kirchoff& Stefan-Boltzmann law.

(Book 1 sections 3.1-3.6,3.12-3.13,4.1-4.11,4.13-4.16)

8 hrs

Unit III: Ideal gas

Equation of state of a gas –internal energy of a real gas-ideal gas-quasistatic adiabatic process-kinetic theory of the ideal gas. **(Book 1 sections 5.1-5.3, 5.5, 5.9)**

Unit IV: The second law of thermodynamics, Carnot cycle& Thermodynamic temperature scale 15 hrs

Conversion of work into heat and vice-versa- principle of heat engines , cyclic process-gasoline engine and its efficiency, Diesel engine and its efficiency- heat engine kelvin Planck statement of second law-refrigerator ; clausius statement of second law – equivalence of both- reversibility & irreversibility –external-internal mechanical irreversibility- external-internal thermal irreversibility-chemical irreversibility-conditions for reversibility- Carnot cycle- Carnot Refrigetor- Carnot's theorem & corollary- the thermodynamic temperature scale-Absolute zero & Carnot efficiency-equality of ideal gas & thermodynamic temperatures.

(Book 1 sections 6.1-6.3, 6.6-6.14, 7.1.7.3-7.7)

Unit V:Entropy &Thermodynamic potentials 14 hrs

Entropy , thermodynamic potentials & open systems Reversible part of second law-Entropy- entropy of an ideal gas - T-S diagram –entropy & reversibility - entropy & irreversibility- irreversible part of second law- heat & entropy in irreversible processes-entropy & non equilibrium states-principle of increase of entropy-entropy & disorder Thermodynamic potentials-Internal energy, Enthalpy- Helmholtz free energy, Gibbsfunction- Maxwells relations,-joule Thomson expansion-first order phase transition ;clausiusclapeyron equation- clausiusclapeyron equation& phase diagrams.

(**Book 1 sections 8.1-8.2, 8.4-8.11,8.13,12.1,12.3-12.4)**

Unit **VI**: **Statistical mechanics** 5hrs

Statistical distribution-MB statistics-Molecular Energies in an ideal gas-quantum statistics- Specific heat of solids **(Book 2Section 9.1-9.4**)

Books for study:

1. Heat and Thermodynamics-Mark W Zemansk,Richard H Dittman (8th Edn.)
2. .Modern Physics by Arthur Beiser

Books for Reference:

1. Basic thermodynamics by E V Guha
2. Statistical Physics by F.Reif

MARKS INCLUDING CHOICE

Unit	**Marks**
I	8
II	12
III	6
IV	14
V	14
VI	6

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	• **Total marks including choice -60** • **Maximum marks of the course-40**	

CORE COURSE IX: ELECTRONICS II

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5B09PHY	3	3	3

COURSE OUTCOME

CO 1: Understand the AC analysis of BJT circuits and CE amplifiers
CO2:Understand the feedback circuits, oscillators and power amplifiers
CO3:Understand OPAMP basics and different OPAMP circuits
CO4:Understand the standard forms Boolean Expressions, Functions of Combinational Logic and K map simplifications.

Unit I: AC analysis of BJT circuits and Small signal amplifiers 10 Hrs.

Coupling and bypass capacitors, AC load lines, transistor models, r-parameters, h-parameters, CE circuit analysis, Decibels and half power points, BJT circuit Frequency response, Single stage CE amplifier, Capacitor coupled and Direct coupled two stage CE amplifiers, Emitter follower.

(Book 1, Sections 6.1-6.4, 8.2, 8.4, 12.1, 12.3, 12.4; Book 2, Section 13.9)

Unit II: Feedback in amplifiers, Signal generators and Power amplifiers 14 Hrs.

Types of feedback, Series voltage negative feedback - advantages, Single stage emitter series current feedback circuit, Concept of positive feedback, Barkhausen criterion, Phase shift, Colpitts, Hartley, and Wien bridge Oscillators, Audio power amplifiers - Transformer coupled Class A, Class B and Class AB amplifiers, Class C tuned amplifier. **(Book 1, Sections 13.1, 13.5, 16.1-16.4, 19.1, 19.2, 19.11)**

Unit III: Operational Amplifiers and their Applications 10 Hrs

Integrated circuit operational amplifiers, Op-amp – Important Parameters, Output voltage, AC analysis, Bandwidth, Slew rate; Ideal Op-amp properties, Applications of Op-amps - Inverting amplifier, Non Inverting amplifier, Voltage follower, Summing amplifier, Difference amplifier, Integrator and Differentiator.

(Book 1, Sections 14.1, 14.7; Book 2, Sections 25.17-25.20, 25.23-25.27, 25.32, 25.34, 25.35, 25.37)

Unit IV: Standard forms of Boolean Expressions 8 Hrs.

The SOP and POS forms, Conversion of a general expression to SOP and POS forms, Converting standard SOP to POS and vice versa, Boolean Expressions and Truth Tables, Karnaugh Map (up to 4 variables), Karnaugh Map SOP minimization.

(**Book 3, Sections 4.6-4.9)**

Unit V: Functions of Combinational Logic 6 Hrs.

Basic Adders - Half Adder, Full Adder; Parallel Binary Adders - 4 Bit Parallel Adder, Comparators, Basic binary Decoder, 4-bit Decoder, Decimal to BCD Encoder.

(Book 3, Sections 6.1, 6.2, 6.4-6.6)

Books for Study:

1. Electronic Devices and Circuits - 5th Edition, David A Bell (Oxford University Press)
2. Principles of Electronics - 11th Edition, V K Mehta & Rohit Mehta (S Chand & Co.)
3. Digital Fundamentals - 8th Edition, Thomas L. Floyd (Pearson Education)

Books for Reference:

1. Electronic Devices and circuit theory - Robert L Boylestad & Louis Nashelsky (Pearson Eduaction)
2. Op-Amps & Linear Integrated Circuits - Ramakant A. Gayakwad (Pearson Eduaction)
3. Electronic Principles - A P Malvino (TMH)
4. The Art of Electronics - Paul Horowitz and Winfield Hill (Cambridge University Press)
5. Digital Principles and Applications - D P Leach and A P Malvino (TMH)
6. Fundamentals of Digital Ciruits - A Anandakumar (PHI)

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	14
II	16
III	12
IV	12
V	6

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6 questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	• **Total marks including choice -60** • **Maximum marks of the course-40**	

CORE COURSE X: SOLID STATE PHYSICS & SPECTROSCOPY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B10PHY	4	4	3

COURSE OUTCOMES

CO 1: Understand basic crystal structure and compare various crystal systems
CO2: State and prove Bragg's law
CO3: Explain X-ray diffraction and various methods to obtain diffraction pattern
CO4: Understand basic properties of semiconductors and band structure of solids
CO5: Discuss Hall Effect and list its applications
CO6: Describe various regions of EM spectrum
CO7: Distinguish between microwave and infrared spectroscopy
CO8: Define Raman Effect and explain its quantum theory

Unit I Structural study of crystalline solids 15Hrs

Introduction – Lattice points and space lattice – The basis and crystal structure – Unit cells and lattice parameters – Unit cell verses primitive cell – Crystal systems – Symmetry elements in crystals – Metallic crystal structures SC, BCC, FCC and HCP structures – Directions, planes and Miller indices – Important features of Miller indices

(Book 1 Chapter 4, Sections I-XVI, XVIII-XIX))

Unit II X-Ray diffraction 8hrs

Bragg's law – Bragg's X Ray Spectrometer – Powder crystal method – Rotating Crystal method **(Book 1 Chapter 5, Sections VII-XI)**

Unit III Semiconducting properties of materials 15hrs

Semiconductors – Intrinsic and extrinsic semiconductors – Band structure of semiconductors – Fermi level of intrinsic and extrinsic semiconductors - Fermi level and carrier concentration in semiconductors – Mobility of charge carriers – Electrical conductivity in semiconductors – Hall effect – Applications of Hall effect

(Book 2: Chapter 13 .1-13.4,13.6, Book 1 section XIV)

Unit IV Spectroscopy **12hrs**

Regions of the spectrum-Microwave spectroscopy-The rotation of molecules-Rotational spectra-The rigid diatomic molecule-Intensities of spectral lines-The effect of isotopic substitution-The microwave oven

(Book 3 chapter 1 section 1.3, chapter2 sections 2.1 - 2.2, 2.3.1 - 2.3.3 , 2.7)

Unit V Infrared spectroscopy **12hrs**

The vibrating diatomic molecule-The energy of diatomic molecule-The Simple Harmonic Oscillator - The Anharmonic Oscillator-The diatomic Vibrating Rotator-The vibration-rotation spectrum of carbon monoxide

(Book 3 chapter 3 sections3.1.1-3.1.3,3.2-3.3)

Unit V Raman Effect **2hrs**

Stokes and Antistokeslines-classicalexplanation-QuantumTheory

[Book 4 section 21.20]

Books for Study:

1. Solid State Physics by S O Pillai, New age international Publishers 8th edition(2018)
2. Solid State Physics Structure and Properties of materials 2nd Edition,MA Wahab Narosapublishing house (2005)
3. Fundamentals of Molecular Spectroscopy-Colin N. Banwell and Elaine M. Mc Cash, 5th edition Tata McGraw-Hill Publishing Company Ltd.
4. Optics by N.Subrahmniam, Brijlal and Dr. M.N Avandhalu, 25th revised edn

Books for Reference

1. Introduction to Solid State Physics, Charles Kittel, Wiley and Sons, 8th Edition.
2. Solid state Physics, Saxena, Guptha, Mandal, PragathiPrakashan
3. Solid State Physics by J.Dekker, MacMillan India Ltd
4. Elementary Solid State Physics by M.A.Omar, Pearson Education
5. Introduction to Spectroscopy, Donald L PaviaCengage Learning Pvt Ltd

MARKS INCLUDING CHOICE

Unit	Marks
I	14
II	5
III	14
IV	12
V	13
VI	2

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problems**	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
• **Total marks including choice -60** • **Maximum marks of the course-40**		

CORE COURSE XI :OPTICS &PHOTONICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B11PHY	4	4	3

COURSE OUTCOME

CO 1: Understand the concept of interference and diffraction

CO2: Distinguish between Fresnel and Fraunhoffer diffraction

CO3: Analyse mathematically diffraction pattern due to slits and apertures

CO4: Understand the concept of polarization and double refraction

CO5: Understand the basic principle and working of lasers

CO6: Explain different types of lasers

CO7:Understand the principle of holography and its applications

CO8:Understand the principle of total internal reflection and propagation of light through optical fibres

CO9:Compare different types of optical fibres and their applicationsOptics and Photonics

Unit 1: **Two beam interference by division of wave front 8hrs**

Introduction-Interference pattern produced on the surface of water-Coherence— Interference of light waves- The interference pattern-Intensity distribution-Fresnel biprism-Interference with white light-Displacement of fringes-The Lloyd’s mirror-Phase change on reflection.

[**Book1 sections 14.1-14.6, (14.6.1excluded), 14.8-14.12]**

Unit 2: **Interference by division of amplitude 10hrs**

Introduction-Interference by a parallel film when illuminated by a plane wave-The cosine law-Non-reflecting films-Highly reflecting films by thin film deposition-Interference by a film with two non-parallel reflecting surfaces-Colour of thin films-Newton’s Rings (reflected system)-Michelson’s Interferometer-determination of wavelength of monochromatic source

[**Book1 sections 15.1-15.4(15.4.1,15.4.2 excluded)15.5,15.7-15.11]**

Unit3:**Fraunhoffer Diffraction 8hrs**

Introduction-Single slit diffraction pattern-Position of maxima and minima-Two slit Fraunhoffer diffraction pattern-position of maxima and minima-N slit diffraction pattern- position of maxima and minima-Width of principal maxima-The plane diffraction grating- Grating spectrum-Resolving power of a grating-resolving power of a prism **[Book1 sections18.1-18.2,18.6-18.8]**

Unit4: Fresnel Diffraction 7hrs

Introduction-Fresnel half period zones-Diffraction by a circular aperture-Diffraction by an opaque disc-The zone plate- comparison between zone plate and convex lens-Diffraction by a straight edge **[Book1 sections20.1-20.3, 20.6]**

Unit5:**Polarization and Double refraction 11hrs**

Introduction- Malus's law- Polarization by reflection-Brewster's law- Nicol prism-Polarization by scattering- -Superposition of two disturbances-Mathematical analysis-The phenomenon of double refraction-Interference of polarized lights-Quarter wave and Half wave plates-Analysis of polarized light. **[Book1Chapter 22.1-22.7]**

Unit 6: Photonics 20 hrs

Lasers-introduction-Interaction of light with matter-Einsteins coefficients and their relations-light amplification-meeting the three requirements-components of a laser-lasing action-principal pumping schemes-role of resonant cavity-types of lasers-Ruby laser-He-Ne laser-semiconductor laser-laser beam characteristics-applications*

[Book2 sections 22.1, 22.4-22.11, 22.14-22.17]

Holography-Introduction-principle of holography-recording and reconstruction-holograms-holograhy and photography-important properties of holograms-applications*

[Book2 sections 23.1-23.2,23.6,23.6.2,23.7,23.9]

Fibre optics-optical fibre-total internal reflection-propagation of light through optical fibre-fractional refractive index-numerical aperture-classification of optical fibres-the three types of fibres-applications*-fibre optic communication system-merits of optical fibres

[Book2 sections 24.1-24.6,24.10-24.11,24.20-24.22]

***Applications of Lasers, Holography and optical fibres –self study by students**

Book for study:

1. Optics by AjoyGhatak (6th Edition) -Tata MC Graw hill publishing company
2. A text book of Optics by Dr.N.Subramhaniam ,Brijlal, Dr. M.N Avandhalu, 25th Revised Edn-S Chand

Books for Reference :

1. Optics –Frank L .Pedrotti, S J Leno S Pedrotti, Leno M Pedrotti
2. Geometrical and Physical optics by P.K.Chakroborthy
3. Optics by Eugene Hecht & A R Ganesan

MARKS INCLUDING CHOICE

Unit	Marks
I	8
II	10
III	6
IV	6
V	12
VI	18

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problems**	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
• Total marks including choice -60 **• Maximum marks of the course-40**		

CORE COURSE XII

6B12 PHY NUCLEAR, PARTICLE & ASTROPHYSICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B12PHY	4	4	**3**

COURSE OUTCOME

CO 1: Understand the structure nucleus and nuclear constituents
CO2: Define nuclear forces and nuclear reactions
CO3: Familiarize elementary particles and their properties
CO4:_ Understand stellar classifications
CO5: Understand basic concepts of birth of the star
CO6: Identify different stars in HR diagram
CO7: Understand the theory of death of the star
CO8: Define white dwarf, neutron star and black hole

Unit I – Nuclear Structure and Radioactivity 14 Hrs

Nuclear Constituents – Nuclear sizes and shapes – Nuclear masses and binding energies – Nuclear force – Radioactive decay – Conservation laws in radioactive decay – Alpha decay – Beta decay – Gamma decay – Natural radioactivity – Mossbauer effect

[Book 2; Sections 12.1 to 12.11]

Unit II– Nuclear Reactions and Applications 12 Hrs

Types of nuclear reactions – Radioisotope production in nuclear reactions – Low-energy reaction kinematics – Fission – Fission reactors – Fusion – Fusion processes in stars – Fusion reactors – Applications of nuclear physics – Neutron activation analysis, Medical radiation physics, Alpha decay applications, Synthetic elements

[Book 2; Sections 13.1 to 13.6]

Unit III Elementary Particles 10 Hrs

The four basic forces – Particles and antiparticles – Families of particles – Conservation laws – Particle interactions and decays – Resonance particles – Energetics of particle decays – Energetics of particle reactions – The Quark Model – The Standard Model

[**Book 2; Sections 14.1 to 14.9]**

Unit IV Basic Tools of Astronomy 14Hrs

Stellar distance-relationship between stellar parallax and distance -– brightness and luminosity –relation between luminosity, brightness and distance Magnitudes-Apparent magnitude and brightness ratio-relationship between apparent magnitude and absolute magnitude-Colour and temperature of the star-relationship between flux, luminosity and radius-stellar spectra-stellar classification-HertzprungRussel diagram-H-R diagram and stellar radius- -H-R diagram and stellar luminosity-H-R diagram and stellar mass

[Book 1 sections 1.1 to 1.12][sections 1.1.1,1.3.1,1.4.1,1.5.1and 1.8.1 are excluded]

Unit V Stars 14Hrs

Star clusters, Red Giants and the H-R Diagram -The Death of Stars-The Asymptotic Giant Branch- Dredge-Ups- Mass Loss and Stellar Winds- Infrared Stars-The End of an AGB Star's Life.- White Dwarf Stars- High-Mass Stars and Nuclear Burning - The End Result of High-Mass Stars' Evolution: Pulsars, Neutron Stars, and Black Holes

[**Book 1 sections 3.11, 3.14, 3.15, 3.16, 3.17 ,3.18 ,3.19, 3.21 ,3.21.1, 3.21.2 ,3.21.3 3.21.4 ,3.22 ,3.24.1, 3.24.2] [sections 3.19.1,3.21.2 are excluded]**

Books for study

1. Astrophysics is Easy: An introduction for the Amateur Astronomer- Mike Ingis- Springer
2. Modern Physics (second edition) by Kenneth Krane, Wiley student edition

Books for reference

1. Modern Physics by R. Murugeshan ,Er. KrithigaSivaprasath-(revised Edition), S.Chand
2. Nuclear Physics by S.N.Ghoshal- S.Chand and Co
3. The Atomic nucleus by R.D Evans -McGrawHill,Newyork

MARKS INCLUDING CHOICE

Unit	Marks
I	14
II	10
III	10
IV	14
V	12

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
- **Total marks including choice -60** - **Maximum marks of the course-40**		

CORE COURSE XIII :ELECTRODYNAMICS AND CIRCUIT THEORY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B13PHY	3	3	3

COURSE OUTCOME

CO 1 : Understand the basic concepts of Electrodynamics

CO2 : Explain the mathematical theoryof Electromagnetic waves

CO3 : Understand different Network theorems

CO4 : Understand the basic concepts of Transient currents

Unit I: Electrodynamics 16Hrs

Ohm's law - Electromotive force – Motional e.m.f - Electromagnetic induction-Induced electric field - Inductance –Self inductance and mutual inductance –Inductance of coupled coils – Energy in a magnetic field –Electrodynamics before Maxwell-How Maxwell fixed Ampere's law– Maxwell's equations – 'Magnetic charge' –Maxwell's equations inside matter - -boundary conditions- Conservation laws-Charge and energy-The continuity equation – Poynting's theorem- Newton's third law in electrodynamics – Potential formulations of electrodynamics – Scalar & vector potentials- Gauge transformations-Coulomb Gauge and Lorenz Gauge .

(**Book 1 sections 7.1, 7.2, 7.3, 8.1, 8.2.1,10.1)**

Unit II: Electromagnetic Waves 12Hrs

Introduction –The wave equation in one dimension – Sinusoidal waves –Boundary conditions – Reflection and transmission – Polarization - Electromagnetic waves in vacuum- The wave equation for E & B –Monochromatic plane waves –Energy and momentum in electromagnetic waves –Propagation in linear media –Reflection and transmission at normal incidence. **(Book 1 sections 9.1, 9.2, 9.3.1, 9.3.2)**

Unit III: **Network Theorems** **10Hrs**

DC Network theorems:-Kirchoff's laws –voltage and current sources-source conversion-superposition theorem- Maximum power transfer theorem- Reciprocity theorem- Thevenin's and Norton's theorems –equivalent circuits-star/delta ,delta/star transformations **(Book 2 sections 2.2,2.15,-2.18,2.21,2.22,2.25,2.30**)

Unit IV: **Transient Currents** **10Hrs**

Charging of a capacitor , time constant ,Discharging of a capacitor ,transient relations during capacitor charging cycle , transient relations during capacitor discharging cycle , AC through Resistance , Inductance and Capacitance , AC through L and R , Power factor , Q factor of a coil , AC through R and C , AC through Series LCR , Resonance in LCR , Q factor of series LCR

(Book 2 5.18 - 5.22,11.28 -11.30,11.32,13.1,13.2,13.5,13.,713.9,13.10;13.17)

Books for study:

1. Introduction to electrodynamics -David .J .Griffiths 3rd edition
2. A text book of Electrical Technology,Volume1, 24thEdn.,B.L.Theraja&A.K.Theraja.

Books for Reference:

1. Feynman lectures on Physics VolumeII
2. Schaum's outline of Theory and Problems of Electromagnetism.

MARKS INCLUDING CHOICE

Unit	**Marks**
I	20
II	15
III	13
IV	12

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	• **Total marks including choice -60** • **Maximum marks of the course-40**	

CORE COURSE XIV: DISCIPLINE SPECIFIC ELECTIVE

COURSE CODE	COURSE TITLE
6B14 PHY(1)	PYTHON PROGRAMMING
6B14 PHY(2)	NANOSCIENCE
6B14 PHY(3)	MATERIAL SCIENCE
6B14 PHY(4)	COSMOLOGY
6B14 PHY(5)	PLASMA PHYSICS

6B14PHY(1).PYTHON PROGRAMMING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B14PHY 1	2	2	3

COURSE OUTCOME

CO 1: Develop skills in creating program sketches of scientific problems
CO2: Develop basic skills in logical thinking and programming
CO3: To make real-life scientific problems easier on a computer with user interaction and graphics

Unit I: Introduction to Python Programming 12 hrs

Introduction to Python language- Python interpreter -interactive and script modes-Variables and data types-Numbers, None, Sequences-string (create, access and manipulate string)-list (create, access and manipulate list objects)-tuple-Mutable and immutable variables-Operators and Operands-arithmetic, relational, logical and assignment operators-Expressions and Statements-Precedence of operators-Input and Output-Comments in python- File input/output-*Programming exercises with applications in Physics*

Unit II: Functions in Python 6 hrs

Functions- Parameters and Arguments-Modules (NumPy and Mathplotlib modules)-Use of Modules in Program (Import and From)-Python packages-Built-in and User defined functions- Composition of functions-Recursion-Vectorised functions- *Programming exercises with applications in Physics*

Unit III Conditional and Looping constructs in Python 5 hrs

Control flow structure- if, elif and else-Nested condition- Looping Constructs- While and For loops- Nested loops-Break and Continue statements- *Programming exercises with applications in Physics*

Unit IV: Arrays and Matrices in Python 5 hrs

Creating arrays and Matrices using functions Arrange, Linspace, Zeros, Ones, Reshape-Arithmetic operations- cross product- dot product - Matrix inversion-Saving and Restoring arrays - *Programming exercises with applications in Physics*

Unit V: Data visualization and Introduction to Numerical Methods 4 hrs

Plotting functions- Plot, Show, Subplot, Polar and Pie functions-Plotting Sine function-Derivative of a function- *Programming exercises with applications in Physics*

Suggested Programming exercises (2 hours from each module; 10 hours):

Calculate the solar mass, Moment of inertia about center of mass (Sphere and Cylinder), Half-life period of a radioactive material, Calculate Rydberg’s constant, Newton’s law of gravitation, Heisenberg’s uncertainty relation, Capacitor discharge in an RC circuit, Plot relativistic and classical momentum against velocity (velocity range 0c to 0.9c, where c is the velocity of light), Planck’s law – plot ‘Planck curves’, Planetary motion - plot the actual orbits of the planet for three eccentricities, Projectile motion – plot x(t) and y(t) for different values of θ, Emission lines of hydrogen atom using Rydberg’s formula (wavelengths), Derivative of Sine function.

Books for reference:

Any standard book can be used as reference. Use of GNU/Linux platforms may be encouraged.

1. Python for Informatics, Charles Severance
2. Core Python Programming, Wesley J Chun, Pearson Education
3. Python Essential Reference, David M. Beazley, Pearson Education
4. A Primer on scientific Programming with Python by Hans PetterLangtangen ; Springer
5. Python tutorial release 2.6.1 by Guido Van Rossum, Fred L Drake (http://www.altway.com/resources/python/tutorial.pdf)
6. How to Think Like a Computer Scientist: Learning with Python, Allen Downey , JeffreyElkner,ChrisMeyers,http://www.greenteapress.com/thinkpython/thinkpython.pdf
7. Numerical Methods in Engineering and Science, Dr. B S Grewal, Khanna Publishers,New Delhi
8. Introductory methods of numerical analysis, S.S.Shastry , (Prentice Hall of India,1983)
9. Programming exercises with applications in physics - Morten Hjorth-Jense (https://www.uio.no/studier/emner/matnat/ifi/IN1900/h17/ressurser/physics_exer.pdf)

Note: *This course introduces programming in the high level language Python. Examples and exercises must be taken from natural science, and instructors must show how problems in physics can be solved by means of mathematics and programming. Instructors can select suitable exercises from the list provided to introduce the content of different modules.*

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	18
II	10
III	10
IV	12
V	10

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
• **Total marks including choice -60** • **Maximum marks of the course-40**		

6B14PHY(2) NANOSCIENCE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B14PHY 2	2	2	3

COURSE OUTCOME

CO 1: Understand the basic concepts of Nanoscience

CO2: Understand the properties of materials in the nano range

CO3: Identify different techniques for the production of nanomaterials

CO4: Understand characterization techniques & applications of nanomaterial.

Unit I-Nanoscience: Introduction 4 hrs

History of nanoscience- Definition of nanometer, nanomaterials and nanotechnology-classification of nanostructured materials with examples-increased surface area of nanoparticles **(Book 1, Chapter 1, 1.1 to 1.3.2)**

Unit II- Properties of materials in the nano-regime 9 hrs

Effect of size reduction on bulk materials- Optoelectronic property of bulk and nanostryuctures- relation between optical properties and electronic structure- electronic structure and Fermi surfaces- electron –Phonon coupling- size effect on physical properties- Luminescence from nanoparticles-thermodynamics of nanoparticles

(Book 1, Chapter 2, 2.7 to 2.12, exclude 2.11)

Unit III- Synthesis of Nanomaterilas 6 hrs

Bottom Up approaches- Sol-gel technique- thin film growth-physical vapour deposition-chemical vapour deposition- top-down approaches-ball milling-lithography

(Book 1, Chapter 4, 4.4 to 4.4.2.4)

Unit IV-Characterization of Nanomaterials 8 hrs

Scanning Electron Microscopy-Transmission Electron Microscopy-Scaning Probe Microscopy- Atomic force Microscopy

(Book 1, Chapter 8, 8.3 to 8.4 and 8.6 to 8.7.1)

Unit V- Application of Nanotechnology 5hrs

Applications in: Material Science- Biology and Medicine-Energy and Environment

Carbon Nanotechnology: Different carbon structures (fullerenes, Carbon nanotubes-Graphene- Graphite and Diamond) - Applications of different carbon structures

(Book 1, Chapter 10,10.1 to 10.5, 10.8, 10.8.3 to10.8.5)

Books for Study:

1. Nanoscience and Nanotechnology: Fundamentals to Frontiers by M S Ramachandra Rao, Shubra Singh, Wiley India Pvt. Ltd.

Book for References:

1. T. Pradeep, "Nano: The Essentials", Tata-McGraw Hill Publishers 2007.
2. Introduction to Nanotechnology, Charles P. Poole, Jr. and Frank J. Owens, Wiley
3. Introduction to Nanoscience & Nanotechnology by K. K. Chattopadhyay and A. N.Banerjee, PHI L earning and Private Limited

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	10
II	16
III	12
IV	12
V	10

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	- **Total marks including choice -60** - **Maximum marks of the course-40**	

6B14PHY(3) MATERIAL SCIENCE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B14PHY (3)	2	2	3

COURSE OUTCOME

CO 1: Understand the basic concepts of material science

CO2: Understand the properties of materials

CO3: Identify different engineering materials & their properties

CO4: Understand the properties & characteristics of semiconducting,insulating &magnetic materials

Unit I -Materials Science: Introduction 3hrs

Definition –Classification of Engineering materials- Levels of structure- Material Structure **(Book 1, Chapter Sections 1,3, 9,10)**

Unit II- Mechanical Properties of metals 4hrs

Types of mechanical properties- Technological properties-Factors affecting mechanical properties **(Book 2, sections 6.1-6.30)**

Unit III-Engineering materials 14hrs

Organic materials-types of organic materials-polymers- types of polymerization-strengthening mechanism of polymers-Plastics—Types of plastics-comparison between thermoplastics and thermosetting plastics-rubber-types of rubbers-vulcanization-composite materials-types of composite materials (in detail)-ceramics-classification of ceramics (in detail) Modern Engineering materials-Metallic Glasses-types of metallic glasses-Shape memory alloys-types of shape memory alloys-Application- Nonlinear materials (qualitative) (**Book 2, sections 14.1-14.14,14.22-14.31,15.1-15.3**,

Book 1, Chapter 20sections 1 to 4)

Unit IV –Semiconductors, Insulators & magnetic material 11hrs

Bonding ,classification of semiconductors-expression for conductivity-P-N junction-Application of voltage across P-N junction-flow of current & V –I Characteristic of a

P-N junction.-semiconducting materials –semiconductor devices-Insulating materials-electric field-flux density-permittivity-dielectric polarization-polarization mechanisms-capacitor-dielectric properties-dielectric loss-dielectric strength-ferroelectric materiaks-hysterisis curve- Magnetic materials -Magnetic field-magnetic moment – Origin of magnetic moment-magnetic field strength- flux density-permeability-magnetization-susceptibility-classification of magnetism –magnetic hysteresis-eddy current loss ferrimagnetism- ferrites-classification of magnetic materials.

(Book 2, sections 18.1-18.28)

Books for Study:

1. Materials Science, S L Kakkani, AmitKakkani, New Age International Publishers, Second Edition
2. Material Science, R S Kurumi, R S Sedha, S Chand & Company Fifth Edition

Book for References:

1. Materials Science and Engineering: An introduction, Wiiliam D Callister Jr., John Wiley and Sons,Inc.

MARKS INCLUDING CHOICE

Unit	**Marks**
I	6
II	10
III	24
IV	20

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
• **Total marks including choice -60** • **Maximum marks of the course-40**		

6B14PHY (4): COSMOLOGY

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	6B14PHY (4)	2	2	3

COURSE OUTCOME

CO 1: Understand history of cosmology at different era
CO2: Explain general theory of relativity and curvature of space
CO3: Understand cosmological principle and Friedmann model
CO4: Explain expansion of universe based on Hubble's law and to state big bang theory

Unit 1 **6 hrs**

A brief History- the universe in myth - the Greek- the renaissance- towards the modern era- cosmology today **(Chapter 1)**

Unit II. **8 hrs**

Einstein and all that- universal gravitation- the Einstein revolution-the equivalence principle- the general theoryof relativity- the curvature of space- black holes and the universe **(Chapter 2)**

Unit III **8 hrs**

First principles- simplicity and symmetry- the cosmological principle- the Friedman models- the singular natureof gravity **(Chapter 3)**

Unit IV **10 hrs**

The expanding universe- Hubble's law- Doppler shift-Interpreting the- Hubble Law-the quest for H_o- the age of the universe- the big bang (**Chapter 4)**

Books for study

1.Cosmology – A Very Short Introduction by Peter Coles (OXFORD)

MARKS INCLUDING CHOICE

Unit	Marks
I	12
II	14
III	14
IV	20

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
• **Total marks including choice -60** • **Maximum marks of the course-40**		

PLASMA PHYSICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
6	6B 14 PHY(5)	2	2	3

COURSE OUTCOME

CO 1: define plasma and plasma parameters
CO2: understand applications of plasma
CO3: determine the behavior of plasma in various E and B Fields
CO4: determine the nature of plasma as a fluid

Unit I Introduction 8 hrs

Definition of plasma –Concept of temperature-Debye shielding-the plasma parameter-Criteria for Plasma-Applications of Plasma Physics-M.H.D Energy Conversion and ion propulsion-solid state plasmas- Gas Lasers

(Book for study 1.1,1.2,1.3.1.4,1.5,1.6,1.7)

Unit II Single Particle Motion 12hrs

Introduction-Uniform E and B fields- gravitational field-non uniform B field- time varying E field- time varying B field- summary of guiding centre drifts

(**Book for study 2.1,2.2,2.3,2.5,2.6,2.7)**

Unit III Plasma as Fluids 12 hrs

Introduction-Relation of plasma physics to ordinary electromagnetics- the equation of motion-the convective derivative-collisions-equation of continuity-equation of state- the complete set of fluid equations

(**Book for study 3.1,3.2,3.3 [3.32excluded])**

Book for study

1.Introduction to Plasma Physics and Controlled Fusion by Francis F.Chen (3rd edition) -Springer

Books for reference

1.Plasma Physics by S.N.Sen
2. Plasma Physics –an Introduction by Richard Fitzpatrick

Marks including choice

Unit	Marks
I	18
II	22
III	20

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(8 questions x Marks 2 each =16)
	Answer any 6 questions	(6questions x Marks 2 each=12)
Part C	**Problem**s	(6 questions x Marks 3 each =18)
	Answer any 4 questions	(4 questions x Marks 3 each=12)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
• **Total marks including choice -60** • **Maximum marks of the course-40**		

CORE COURSE XV: Practical II General Physics II

Semester	Course code	Hours per week	Credit	Exam hours
VI	6B15PHY	4	4	3

COURSE OUTCOME

CO1 : Familiarise with apparatus for mechanical, electrical, magnetic and optical experiments.

CO2: Develop skill in setting up of apparatus for accurate measurement of physical quantities.

CO3: Understand multiple experimental techniques for determining physical quantities.

CO4: Develop skill in systematic way of measurements by minimising possible errors.

CO5: Develop skill to analyse by plotting graphs using software.

CO6: Develop skill for systematic trouble shooting.

CO7: Perform error analysis for experiments.

Note: A brief theoretical back ground of each experiment must be given to the students before each cycle of experiments and assess it. Students have to maintain a practical log book regularly signed by the teacher in charge and to be submitted at the time of University Examination. Fair record is not required. All the 20 experiments have to be performed.

Special Instructions

1. For plotting graphs of experiments mentioned, any software (excel, origin etc) must be used.
2. Error analysis should be done for the mentioned experiments.

LIST OF EXPERIMENTS

1. Spectrometer –i-d curve (Graph using software)
2. Spectrometer –i-i' curve (Graph using software)
3. Spectrometer-Cauchy’s constants assuming wavelengths
4. Spectrometer –grating-normal incidence
5. Spectrometer –grating- minimum deviation

6. Air Wedge-Diameter of a thin wire

7. Newton’s Rings- wavelength of sodium light

8. Laser-Slit width from diffraction pattern

9. Potentiometer- Calibration of ammeter (Graph using software)

10. Potentiometer-Calibration of High range voltmeter (Graph using software)

11. Potentiometer-Reduction factor of TG and B_0(Error analysis is required)

12. Circular coil - Determination of m and B_0 (Error analysis is required)

13. Carey Fosters’ Bridge-Temp-coefficient of resistance

14. Conversion of Galvanometer into voltmeter- calibration using potentiometer

15. Conversion of Galvanometer into ammeter- calibration using potentiometer

16. Verification of The venin’s and Norton’s theorem

17. Verification of Maximum Power Transfer Theorem

18. Mirror Galvanometer-Figure of Merit

19. Ballistic Galvanometer- absolute capacity of a capacitor

20. Ballistic Galvanometer- high Resistance by Leakage (Error analysis is required)

Reference Books

1. Practical Physics by P R Sasi Kumar PHI Learning Private Limited
2. BSc Practical Physics by C L Arora ,S Chand
3. An advanced course in Practical Physics by D.Chattopadhyay& P C Rakhit New Central Book Agency(P)Ltd

MARKS DISTRIBUTION

Sections	**Marks**
I Principle with theory	10
II Performance	6
III Observation	14
IV Viva to evaluate the skill & knowledge about the experiment	4
V Calculation ,Graph etc	6

CORE COURSE XVI: PRACTICAL III ELECTRONICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
VI	**6B16PHY**	**4**	**4**	**3**

COURSE OUTCOME

CO1: Familiarise active and passive electronic components.

CO2: Familiarise multimeter, power supply, signal generator and cathode ray oscilloscope.

CO3: Develop skill in soldering and use of breadboard.

CO4: Develop skill in construction of rectifiers, voltage regulators, amplifiers and oscillators.

CO5: Observe, measure and analyse electrical signals.

CO6: Develop skill for trouble shooting circuits and components.

CO7: Develop skill to analyse by plotting graphs using software.

Note: A brief theoretical background of each experiment must be given to the students before each cycle of experiments. Students have to maintain a practical log book regularly signed by the teacher in charge and to be submitted at the time of University Examination. Fair record is not required. All the 20 experiments have to be performed. Students may refer the diode/transistor/IC data manual to get details of the components.

1. Characteristics of a semiconductor diode
2. Half wave & Full wave (2 diodes) Rectifiers - Study of ripple factor with and without filter (by soldering)
3. Bridge Rectifier- Study of ripple factor with and without filter (by soldering)
4. Voltage multiplier (Quadrupler) circuit (by soldering)
5. Voltage regulator using Zener diode after finding Zener voltage (Line and Load regulations)
6. Common Emitter characteristics of BJT
7. Realization of basic logic gates (OR, AND & NOT) using transistors (by soldering)
8. Single stage Common Emitter amplifier - Gain and Frequency response (by soldering)
9. Power amplifier (Class A) using transistor - Frequency response and band width
10. Voltage series and Current series Feedback circuits using transistors
11. Single transistor voltage regulator (Line and Load regulations)
12. Hartley Oscillator using transistor (by soldering)

13. Phase Shift Oscillator using transistor
14. Astable Multi vibrator using transistors
15. Inverting amplifier, Non-inverting amplifier and voltage follower using Op-amp
16. Summing and Difference amplifier using Op-amp
17. Differentiator and Integrator using Op-amp
18. Wien Bridge Oscillator using Op-amp
19. Half and Full Adders using XOR and NAND gates
20. Minimization of a three variable Boolean expression/Truth table using Karnaugh Map and realization using NAND gates.

References:

1. Electronics Lab Manual - Dr. K A Navas (Rajath Publishers, Vol. I & II)
2. Advanced Practical Physics - S P Singh (Pragati Prakashan Meerut, Vol. II)
3. The Art of Electronics - Paul Horowitz and Winfield Hill (Cambridge University Press)
4. BSc Practical Physics - C L Arora (S Chand & Co.)
5. A text book of Advanced Practical Physics - Samir Kumar Ghosh (New Central Book Agency)

MARKS DISTRIBUTION

Sections	**Marks**
I Principle with theory	10
II Performance	6
III Observation	14
IV Viva to evaluate the skill & knowledge about the experiment	4
V Calculation ,Graph etc	6

6B17 PHY PROJECT EXTERNAL EVALUATION MARK DISTRIBUTION

Sections	**Marks**
I Relevance of topic	10%
II Methodology	20%
III Quality of analysis & findings	20%
IV Viva -Voce	50%

PART B:

PHYSICS COMPLEMENTARY ELECTIVE COURSES

[FOR BSc PROGRAMMES]

WORK AND CREDIT DISTRIBUTION

(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS	MARKS		
						CE	ESE	TOTAL
1C01PHY	MECHANICS	I	2	2	3	8	32	40
2C02PHY	ELECTRICITY, MAGNETISM AND THERMODYNAMICS	II	2	2	3	8	32	40
3C03PHY	OPTICS AND PHOTONICS	III	3	2	3	8	32	40
4C04PHY	ELECTRONICS AND MODERN PHYSICS	IV	3	2	3	8	32	40
4C05PHY	PHYSICS PRACTICAL	IV	2	4	3	8	32	40

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

INTERNAL ASSESSMENT THEORY

COMPONENT*	WEIGHTAGE**	REMARKS
COMPONENT 1 Test paper	60%	Best of any two
COMPONENT 2 Assignment /Seminar/Viva	40%	One

CONTINUOUS INTERNAL ASSESSMENT PRACTICAL

COMPONENT*	WEIGHT AGE**	REMARKS
COMPONENT 1 Lab Skill	25%	
COMPONENT 2 Punctuality	25%	
COMPONENT 3 Record	25%	A logbook of practicals should be maintained which must include theory,observation,tabulation,calculation ,graph ,result etc
COMPONENT 3 TEST PAPER	25%	A model exam should be conducted before external examination &should be considered for internals

COMPLEMENTARY ELECTIVE COURSE I: -MECHANICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
I	ICO1PHY	2	2	3

COURSE OUTCOME

CO 1: Understand the basic concepts of Properties of matter
CO2: Explain the dynamics of rigid bodies.
CO3: Understand the basic concepts of wave motion and oscillations

UNIT 1: Properties of matter :13 Hours

Elasticity: Hooke's law, moduli of elasticity- Poisson ratio, Twisting Couple on a cylindrical rod- Bending of Beams-Bending Moment, Cantilever, Transverse vibrations of a loaded cantilever, Uniform and Non-uniform Bending, Determination of Young modulus using uniform bending – mirror and telescope method

Viscosity: Viscosity, Critical velocity, Flow of liquid through a capillary tube, Poiseulle's formula, Stokes formula.

Surface tension: Surface energy - expression for excess pressure on a curved surface – Capillary action – Explanation of capillary action - Measurement of surface tension by capillary tube method

(Book 1: Section – 12.1-12.10, 12.13-12.14, 12.15-12.23, 14.1-14.3, 14.6, 15.1-15.4, 16.1-16.13.16.21-16.22)

UNIT 2: Dynamics of Rigid Bodies: - 6 Hours

Rigid body , Centre of mass , Angular momentum and Torque, Moment of inertia , Radius of gyration, Theorems on moment of Inertia, Moment of inertia of thin Rod, Circular Disc, Annular Ring, Cylinder (solid and hollow) and Sphere (solid). Moment of inertia of fly wheel

Book 1: Section – 6.2, 8.1, 8.5- 8.6.8.9)

UNIT 3: Oscillation and waves: (13 Hours)

Harmonic Oscillator : Periodic motion, Simple harmonic oscillator, Energy of Simple harmonic oscillator, Compound Pendulum , Torsion pendulum, Damping force , Damped Harmonic oscillator , Quality factor, Galvanometer with low damping , LCR circuit

Wave Motion: General equation of wave motion, Plane progressive harmonic wave, Energy density and Energy flow/current for plane progressive wave, Transverse waves in stretched strings, Longitudinal waves in rods and gases, Stationary waves, Waves in a linear bounded medium, Flow of energy in stationary waves.

Book 1: Section – 9.1- 9.4, 9.8,10.1-10.2, 10.4- 10.5, 11.1-11.4, 11.6- 11.10

Books for study:

1. Mechanics – J.C. Updhyaya
2. Mechanics - D.S.Mathur

Books for reference:

1. Feynman lectures on Physics by Richard Feynman
2. Fundamentals of Physics by Resnick & Haliday

MARKS INCLUDING CHOICE:

Unit	Marks
I	20
II	10
III	22

PATTERN OF QUESTIONS

Part A	**Short answer**	(5 questions x Mark 1 = 5**)**
	Answer all questions	(5 questions x Mark 1 = 5)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Problem**s	(5questions x Marks 3 each =15
	Answer any 4 questions	(3questions x Marks 3 each=9)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
	• **Total marks including choice -52** • **Maximum marks of the course-32**	

COMPLEMENTARY ELECTIVE COURSE II:ELECTRICITY, MAGNETISM AND THERMODYNAMICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
II	2CO2PHY	2	2	3

COURSE OUTCOME

CO 1: Understand the basic concepts of Magnetism &electricity
CO2: Explain the magnetic effects of electric currents
CO3: Understand the basic principles of Thermodynamics

UNIT 1: Magnetism and Electricity 10 Hours

Magnetism: Magnetic properties of materials – Magnetic Induction, Magnetisation, Relation between the three magnetic vectors B,H and M, Magnetic susceptibility, Magnetic permeability, properties of Dia, Para and Ferro magnetic materials, Anti ferromagnetism and ferrimagnetisms, magnetic element at a place, Deflection magnetometer, Searle's vibration magnetometer, Box type vibration magnetometer.

Electricity : Carey Foster bridge-theory, determination of resistance, resistivity and temperature coefficient, Potentiometer- theory, Calibration of Ammeter, Calibration of Voltmeter (low &High Range) conversion of galvanometer into ammeter and voltmeter.

(**Book 1: Section – 15.1 – 15.9, 42.1, 7.1-7.2, 39.2-39.3,42.10-42.15)**

UNIT 2: Magnetic effect of electric current 9 Hours

Biot-Savart law, Magnetic induction at a point due to a straight conductor carrying current, Magnetic induction at a point on the axis of a circular coil, Lorentz force, Force on a current carrying conductor, Torque on a current loop in a uniform magnetic field, Theory and working of moving coil Ballistic Galvanometer, figure of merit of B.G and its determination.

(**Book 1: Section – 10.1 - 10.4, 10.7, 10.10-10.13)**

UNIT 3: Thermodynamics 13 Hours

Thermodynamic systems, Thermodynamic processes, Thermodynamic equilibrium, Zeroth law thermodynamics, Work- A path dependent function, Internal Energy, First Law of thermodynamics, Applications of first law, The indicator Diagram, Work done during an Isothermal Process and Adiabatic Process, Adiabatic and Isothermal Elasticises, Second law of thermodynamics, Carnot's engine , Derivation of efficiency using Carnot's cycle , Carnot's theorem , Refrigerator, Coefficient of performance , Concept of entropy, Change of entropy in reversible and irreversible cycles, Principle of increase of entropy.

(Book 2: Section – 4.1 – 4.7, 4.10-4.15, 4.21-4.29, 5.1-5.6)

Books for study:

1. Electricity and Magnetism (2008th edition)-R.Murugeshan
2 Heat and Thermodynamics (16th edition) by Brijlal and Subramanian

Books for reference:
1. Electricity and Magnetism-D.N .Vasudeva
2. Heat and Thermodynamics-D.S.Mathur.
3. Introduction to electrodynamics -David .J .Griffiths
4. Heat & Thermodynamics: W.Zemansky, McGraw Hill

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	18
II	14
III	20

PATTERN OF QUESTIONS

Part A	**Short answer**	(5 questions x Mark 1 = 5**)**
	Answer all questions	(5 questions x Mark 1 = 5)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Problem**s	(5questions x Marks 3 each =15
	Answer any 4 questions	(3questions x Marks 3 each=9)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
- **Total marks including choice -52** - **Maximum marks of the course-32**		

COMPLEMENTARY ELECTIVE COURSE III: OPTICS AND PHOTONICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
III	**3C03PHY**	**3**	**2**	**3**

COURSE OUTCOME

CO 1: Understand the basic concepts of Interference
CO2:Understand the basic concepts of Diffraction
CO3: Understand the basic concepts of Polarization
CO4: Understand the basic concepts of Photonics and Fibre Optics

UNIT – 1: Interference 12 Hours

Interference of light, principle of superposition, Conditions for maximum and minimum intensities, Coherent sources, Theory of interference fringes, Colours of thin films-interference due to reflected light, Interference due to transmitted light, Fringes produced by a wedge shaped thin film, Newton's Rings by reflected light, Determination of wave length of sodium light and Refractive index of a transparent liquid by Newton's rings. (**Book 1: Section: 2.1 – 2.2, 2.5 - 2.10)**

UNIT- 2: Diffraction 12 Hours

Fresnel and Fraunhofer diffraction - Fresnel's Explanation of Rectilinear Propagation of light- Zone plate, Diffraction at a straight edge, Fraunhofer Diffraction at a single slit, Plane Transmission Diffraction Grating, Dispersive power of a Grating, Determination of wavelength of light using Transmission Grating. Comparison between interference and Diffraction (**Book 1: Section: 3.1 – 3.5, 3.7, 3.10, 3.12, 3.14, 3.17, 3.25)**

UNIT - 3: Polarization 9 Hours

Introduction, Polarization of light, Polarization by reflection, Pile of Plate, Law of Malus, Double Refraction, Huygen's theory of double refraction in uniaxial crystal, Nicol Prism, Theory of production of Elliptically and Circularly Polarised light, Quarter wave plates, Half wave plate, Production and detection of Plane, Circularly and Elliptically polarized light **(Book 1: Section: 4.1-4.6, 4.8, 4.10 - 4.14)**

UNIT– 4: Photonics 15 Hours

Laser: Absorption and emission of light, Induced absorption, Spontaneous emission and Stimulated emission, Einstein's relations , Principle of Laser, Meta stable state, Population inversion, Pumping, Pumping methods – Optical pumping, Electrical pumping and Direct conversion, Types of laser - Ruby laser, Helium Neon laser and Semi conductor laser, Properties of laser beams, Applications of lasers-Holography (principle, recording and reconstruction)

Fibre Optics: Introduction, Total internal reflection, Step index fibre, Graded index fibre, Light propagation in fibres, Acceptance angle, Numerical Aperture, The Coherent

Bundle, Fibre optic Communication system, Advantage of Fibre – Optic Communication system, Fibre optic sensors, Applications- Fibre optic Communication system.

(Book 2 : Section – 19.1-19.5Book 1: 8.1 – 8.6, 8.10, Ref. Book 3- chapter 38)

Books for study:

1. Optics and Spectroscopy by R Murugeshan, Kiruthiga ivaprasath, S Chand
2. Modern Physics by R Murugeshan, Kiruthiga Sivaprasath, S Chand

Books for reference:

1. Optics by Subramanayam, Brijlal, MN Avadhanalu, S.Chand
2. Optics- Ajay Ghatak
3. Basic Electronics – Solid state – B..L. Thereja
4. Laser fundamentals – Silfast

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	12
II	12
III	10
IV	18

PATTERN OF QUESTIONS

Part A	**Short answer**	(5 questions x Mark 1 = 5**)**
	Answer all questions	(5 questions x Mark 1 = 5)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Problem**s	(5questions x Marks 3 each =15

	Answer any 4 questions	(3questions x Marks 3 each=9)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
• Total marks including choice -52 **• Maximum marks of the course-32**		

COMPLEMENTARY ELECTIVE COURSE IV:ELECTRONICS AND MODERN PHYSICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
IV	**4C04PHY**	**3**	**2**	**3**

COURSE OUTCOME

CO 1: Understand the basic concepts of Basic electronics
CO2: Understand the basic concepts of Digital electronics
CO3: Understand the basic concepts of Nuclear Physics
CO4: Understand the basic concepts of Particle physics and Astrophysics

UNIT – 1: Basic Electronics 15 Hours

Semiconductors, pn junction, Current-voltage characteristics of pn junction- Forward and Reverse bias, Diode, Half wave, Full wave and bridge rectifier circuits, Efficiency and ripple factor, Filter circuits- capacitor filter and π filters, Zener diode and its characteristics, Voltage stabilization, Transistors- CB, CE, CC Configurations, Characteristics, Current amplification factors, Relation connecting α, β and γ , CE Amplifier, Feedback, Principle of negative voltage feedback in Amplifier, Gain and advantage of feedback – Sinusoidal oscillator , Oscillatory Circuit, Positive feedback Amplifier – Oscillator, Colpit's oscillators and Hartley oscillators.

(**Book 1: 5.1, 5.8 – 5.20, 6.1, 6.7 –6.11, 6.13 - 6.15, 6.18, 6.20-6.21, 6.25, 6.27 – 6.28, 8.1 – 8.5, 8.7 – 8.10, 8.12 – 8.16, 13.1 – 13.4, 14.1 – 14.3, 14.5, 14.10- 14.11)**

UNIT2– 2: Digital Electronics 9 Hours

Introduction, Analogue and Digital signals, Number systems – Decimal, binary, Octal, Hexadecimal number systems- Conversion between different number systems, BCD Code, Logic gates - AND, OR, and NOT Universal gates – NAND and NOR , XOR gate, Boolean Algebra, Boolean Theorems, de Morgan's theorems, Binary Addition, Half adder and Full adder

(Book 1: Section – 26.1 – 26.17, 26.20 – 26.22, 26.31 – 26.32)

UNIT – 3: Nuclear Physics 12 Hours

Introduction, Classification of Nucleus, General properties of Nucleus, Binding energy, Nuclear Stability, Nuclear force, Stability of nucleus, Radioactivity , Natural radioactivity, Alpha, Beta and Gamma Rays and its Properties, Law of radioactive decay , Half life, Mean life, Radioactive dating – age of the earth, Nuclear fission, Energy Released in Fission, Nuclear reactors, Nuclear fusion, Source of Stellar Energy

(**Book 2: Section – 27.5 – 27.6, 27.7, 31.2-31.6, 31.29 – 31.33, 31.35, 35.2 – 35.3, 35.6- 35.8)**

UNIT– 4: Particle physics and Astrophysics 12 Hours

Particle Physics: Introduction, Classification of elementary particles – Particles and Anti- particles, Fundamental interaction, , Elementary particle quantum number, Idea of Quarks, The quark model, Compositions of hadrons according to quark model.

Astrophysics : Introduction, Classification of stars –The Harvard classification system, Hertzprung - Russel diagram, Luminosity of a star, Stellar Evolution, Chandrasekhar limit, White dwarfs, Neutron stars, Black Holes , Supernova Explosion.

(Book 2: Section – 38.1 – 38.2, 38.4 – 38.5, 38.7, 78.1 – 78.6, 78.8 - 78.11

Books for study:

1 Principles of Electronics-VK Mehta, S. Chand
2 Modern Physics – R .Murugeshan and Kiruthiga Sivaprasath , S. Chand

Books for reference:

1 Basic Electronics – Solid state – B..L. Thereja
2 Electronic Devices and Circuits- 5th Edition, David A Bell (Oxford)
3 Digital Principles and Applications - D P Leach and A P Malvino (TMH)
4 Concepts of Modern Physics, Arthur Beiser, TMH

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	16
II	10
III	14
IV	12

PATTERN OF QUESTIONS

Part A	**Short answer**	(5 questions x Mark 1 = 5**)**
	Answer all questions	(5 questions x Mark 1 = 5)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)

Part C	**Problem**s	(5questions x Marks 3 each =15
	Answer any 4 questions	(3questions x Marks 3 each=9)
Part D	**Long Essay**	(4 questions x Marks 5 each =20)
	Answer any 2 questions	(2 questions x Marks 5 each=10)
- **Total marks including choice -52** - **Maximum marks of the course-32**		

COMPLEMENTARY COURSE V – PHYSICS PRACTICAL

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS
4C05PHY	PHYSICS PRACTICAL	IV	2	4	3

COURSE OUTCOME

CO1: Familiarise with apparatus for experiments in mechanics, optics, electricity and magnetism and electronics and electronics experiments.

CO2: Develop skill in setting up of apparatus for accurate measurement of physical quantities.

CO3: Understand multiple experimental techniques for determining physical quantities.

CO4: Develop skill in systematic way of measurements by minimizing possible errors.

Note: A brief theoretical back ground of each experiment must be given to the students before each cycle of experiments . Students are to maintain a practical log book regularly signed by the teacher in charge. Fair record not required. All the experiments are to be done.

LIST OF EXPERIMENTS

1. Flywheel- Moment of inertia
2. Compound pendulum-determination of g and K
3. Torsion pendulum- Moment of inertia of a disc
4. Young’s modulus - Uniform Bending - using optic lever
5. Young’s modulus – Non-uniform bending - using pin and microscope
6. Liquid lens - Refractive Index of material of lens using liquid of known refractive index
7. Spectrometer – Refractive index of the material of a prism
8. Spectrometer – grating-normal incidence
9. Surface tension-Determination of surface tension of given liquid
10. Air Wedge-Diameter of a thin wire
11. Newton’s Rings- wavelength of sodium light
12. Deflection Magnetometer –Tan A and Tan B
13. Searle’s Vibration magnetometer- magnetic moment
14. Carey Fosters Bridge- resistivity
15. Potentiometer- resistivity
16. Potentiometer- Calibration of ammeter
17. Newton’s law of cooling- Specific heat capacity of given liquid
18. Construction of half wave rectifier with and without filter - ripple factor & load regulation

19. Construction of regulated power supply using Zener diode
20. Construction of Logic gates – AND , OR, NOT- verification of truth table

Reference Books

1. Practical Physics by P R Sasi Kumar PHI Learning Private Limited
2. BSc Practical Physics by C L Arora ,S Chand
3. An advanced course in Practical Physics by D.Chattopadhyay& P C Rakhit New Central Book Agency(P)Ltd
4. BSc Practical Physics - C L Arora (S Chand & Co.)

MARK DISTRIBUTION

Section	**Marks**
Principle and formula	6
Performance	6
Observation	14
Calculation ,Graph & Result	6

PART C:

GENERIC ELECTIVE COURSES
WORK AND CREDIT DISTRIBUTION
(2019 ADMISSION ONWARDS)

COURSE CODE	COURSE TITLE	SEMESTER	HOURS PER WEEK	CREDIT	EXAM HOURS	CE	ESE	TOTAL
5D 01 PHY	**INTRODUCTION TO CLIMATE AND CLIMATE CHANGE SCIENCE**	**V**	2	2	2	5	20	25
5D 02 PHY	**RENEWABLE ENERGYSOURCES**	**V**	2	2	2	5	20	25
5D 03 PHY	**BIOPHYSICS**	**V**	2	2	2	5	20	25
5D 04 PHY	**JOY OF STAR WATCHING**	**V**	2	2	2	5	20	25
5D 05 PHY	**ELECTRICITY IN DAILY LIFE**	**V**	2	2	2	5	20	25
5D 06 PHY	**INTRODUCTION TO BASIC ELECTRONICS**	**V**	2	2	2	5	20	25

EVALUATION

ASSESSMENT	WEIGHTAGE
EXTERNAL	80%
INTERNAL	20%

INTERNAL ASSESSMENT

COMPONENT *	WEIGHTAGE**	REMARKS
COMPONENT 1 TEST PAPER	70%	ONE
COMPONENT 2 ASSIGNMENT/VIVA	30%	ONE

5D01PHY:INTRODUCTION TO CLIMATE AND CLIMATE CHANGE SCIENCE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5 D 01 PHY	2	2	2

COURSE OUTCOME

CO1:Understand the basic concepts of climate change science

CO2:Understand some of the potentially serious consequences of climate change

CO3:Analyse linkages between climate change adaptation and development planning.

CO4:Describe relevant policy approaches and strategic frameworks for climate change mitigation

CO5:Identify international initiatives which support countries to plan for climate change

Unit 1: The basics of climate change science. 8Hrs

An overview of key concepts such as weather, climate, and concept of energy balance; the greenhouse gas effect, and their main sources -the circulation in the atmosphere and ocean, and human contribution to climate change - some of the main observed changes in the climate since the industrial revolution- projected future trends and impacts of climate change on surface temperature, precipitation, ocean pH, sea-level and Arctic sea-ice extent. - overview of main sources of scientific climate information, relevant programmes and institutions.

Unit2: An overview of some of the potential consequences of climate change 5Hrs

sea level rise- flood, drought, extreme weather events and disruption of the global food supply that could have major negative impacts on humanity- the uncertainties in how the future may unfold, the important concept of risk as a means of dealing with uncertainty, and the different levels of risk associated with different consequences.

Unit3: Climate Change Adaptation 7Hrs

key definitions and some of the expected consequences of climate change on key sectors.-framework for assessing climate vulnerability. -different adaptation measures that can be implemented for various vulnerable sectors- a short introduction to linkages between climate change adaptation and development- important international adaptation initiatives and programmes.

Unit 4: Climate Change Mitigation 5hrs

Key definitions of mitigation and an overview of emissions levels and mitigation targets per country.-ways to integrate mitigation into development planning, through low-emission development strategies. -the main economic sectors where mitigation actions can be applied.-some of the key international mechanisms created to assist countries in planning and implementing mitigation actions.

Unit 5: Planning for Climate Change 7Hrs

overview of different dimensions and entry points for climate change planning.- the roles of national and sectoral, as well as sub-national institutions in climate change planning- five-step methodology for preparing a low-emission climate- resilient development strategy- some of the main international initiatives to support climate change planning.

Book for study

1 Introduction to climate change:lecture notes for Meteorologists: Prepared byDavid D. Houghton

References:

1. An Introduction to Atmospheric Physics : D.G. Andrews
2. Descriptive Physical Oceanography : G Dietrich
3. The Physics of Atmospheres : John Houghton
4. The Discovery of Global Warming : Spencer R Weart
5. Storms Of My Grandchildren : James Hansen
6. Evaluating Climate Change Action for SustainableDevelopment: Juha I. Uitto, JyotsnaPuri, Rob D. van den Berg

MARKS INCLUDING CHOICE:

Unit	Marks
I	8
II	4
III	6
IV	4
V	8

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Essay**	(2questions x Marks 6 each =12
	Answer any 4 questions	(1question x Marks 6 each=6)
• **Total marks including choice -30** • **Maximum marks of the course-20**		

5D02PHY RENEWABLE ENERGY SOURCES

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	**5 D 02 PHY**	**2**	**2**	**2**

COURSE OUTCOME

CO 1: Understand the sources of renewable energy
CO2: Understand the solar energy measurements &its applications
CO3: Understand the wind energy production &applications
CO4: Identify the energy from biomass,geothermal & ocean

Unit I Introduction 2hrs

Renewable energy sources- prospects of renewable energy sources

[**Book I 1.1,1.5,1.6]**

Unit II Solar energy 12hrs

Solar constant –solar radiation measurements- physical principles of conversion of solar radiation in to heat-solar energy storage system-solar pond-solar water heating-solar thermal electric conversion- solar photo voltaic-solar distillation-solar pumping-solar furnace-solar cooking-solar green houses-solar production of hydrogen

[Book I 2.2,2.5,3.2,4.2,4.3,5.2,5.5,5.8-5.13]

Unit III Wind energy 10hrs

Introduction-basic principles of wind energy conversion-site selection considerations-Basic component of WEC energy conversion systems-Classification of WEC systems-wind energy collectors –energy storage & application of wind energy

[Book I 6.1-6.2,6.4,6.5-6.6,6.8.6.12-6.13]

Unit IVBiomass energy ,geothermal energy&energy from oceans 8hrs

Biomass conversion technologies-photosynthesis& biogas generation.-geothermal energy-geothermal sources-hydrotheralgeopressured resources-operational &environmental problems-geothermal energy in india-occean thermal energy conversion

[Book I 7.1-7.4,8.1,8.4-8.6,8.17-8.18,9.1-9.2]

Books for Study:

1.Non-conventional energy resources-G D Rai

Books for Reference:

1.Solar energy fundamentals & application-H.PGarg

2. Solar energy-G D Rai

MARKS INCLUDING CHOICE:

Unit	Marks
I	2
II	14
III	8
IV	6

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6**)**
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Essay**	(2questions x Marks 6 each =12
	Answer any 4 questions	(1question x Marks 6 each=6)
• **Total marks including choice -30** • **Maximum marks of the course-20**		

5 D 03 PHY: BIOPHYSICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	**5 D 03 PHY**	**2**	**2**	**2**

COURSE OUTCOME

CO1: Understand the application of Physics in Biology and Medical fields

CO2: Understand the principles behind the movement of snakes, swimming of fishes and flying of birds

CO3: Understand about bioelectricity

CO4: Understand the principles behind EEG and ECG

CO5: Understand the sources of radiation and effects of radiation

CO6: Understand the basic principles of radiation protection and apply it in daily life.

Unit1 Bio-mechanics 12 Hrs

Types of muscles- striated, cardiac, tonic muscles, properties of muscles-Excitability – conductibility-contractibility – extensibility – tonicity – structure of striated muscles – Newton's laws – centre of mass – Bio-mechanical analysis of movements of snakes – swimming of fishes – aerodynamic basis of flights (Book-1 Chapter 12)

Unit II Bio – medical instrumentation 8Hrs,

Electrical Methods to study the brain activity- Electroencephalography (EEG) - Electrocardiography (ECG) (Book 2 Chapter 4))

Unit III Radiological Health and Safety 12 Hrs

Sources of Radiation – Natural Background exposure – Medical exposures – Consumer products – Occupational exposure – Biological effects of radiation – Deterministic

Effects – Stochastic effects – Acute radiation syndrome – Radiation risk- Principles of radiation protection – Effect of time ,distance and shielding (Book 4 Chapter 13)

Books for study

1 Introduction to Bio-Physics by Pranab Kumar Banerjee (S Chand)

2 Medical Bio- Physics by R N Roy – (Books and allied (P) Ltd)

3 The Physics of Radiology and Imaging – K Thayalan (JAYPEE Jaypee Brothers Medical Publishers (P) Ltd

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	10
II	9
II	11

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6**)**
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Essay**	(2questions x Marks 6 each =12
	Answer any 4 questions	(1question x Marks 6 each=6)
- **Total marks including choice -30** - **Maximum marks of the course-20**		

5 D 04 PHY:JOY OF STAR WATCHING

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5 D 04 PHY	2	2	2

COURSE OUTCOME

CO 1: Understand Our Universe and its origin
CO2:Understand simple constellations
CO3:Explain the stars in Kerala culture
CO4:Understand the techniques of star watching

UnitI: **Astrophysics** **12Hrs**

The study of the Universe - Problems and prospects. The Universe - its origin-_Galaxies__Milkyway. A star is born. The death of a star. The comets–The pole star

(Book 1)

Unit II: The constellations **2 Hrs**

Orion- Canis major-Taurus—Leo **(Book 2)**

Unit III Stars in Kerala culture **10Hrs**

The origin and expansion of Astrology -Stars and constellations in Kerala culture-

(Book 2)

Unit IV: Star watching **8 Hrs**

How to experience star watching — For a better view (**Book 2)**

Books for study:

1. The Great Universe- G.K.Sasidharan- S.Chand
2. Joy of star watching – BimanBasu- National Book Trust , India.

Book for reference:

1. Jyothishavum Jyothisasthravum- K. Pappootty-K.S.S.P

MARKS INCLUDING CHOICE:

Unit	**Marks**
I	8
II	5
III	8
IV	9

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6**)**
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Essay**	(2questions x Marks 6 each =12
	Answer any 4 questions	(1question x Marks 6 each=6)
• **Total marks including choice -30** • **Maximum marks of the course-20**		

5 D05PHY : ELECTRICITY IN DAILY LIFE

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5 D05PHY	2	2	2

COURSE OUTCOME

CO 1: Understand the sources of Electricity
CO2: Explain the production of Electricity
CO3: Understand the basic concepts of electricity auditing

Unit I 12Hrs

What is Electricity-Different sources of electricity- non conventional and conventional sources

Unit II 12Hrs

Methods to produce electricity - How electricity is generated and transmitted- Uses and misuses of electricity -Methods of electricity conservations-How to save electricity

Unit III 8Hrs

Electricity Auditing

Books for reference

Hand books on Electricity conservation and Electricity auditing by EMC of Govt of Kerala

MARKS INCLUDING CHOICE:

Unit	Marks
I	10
II	10
III	10

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6**)**
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Essay**	(2questions x Marks 6 each =12
	Answer any 4 questions	(1question x Marks 6 each=6)
• **Total marks including choice -30** • **Maximum marks of the course-20**		

5 D06PHY :INTRODUCTION TO BASIC ELECTRONICS

SEMESTER	COURSE CODE	HOURS PER WEEK	CREDIT	EXAM HRS
V	5 D06PHY	2	2	2

CO 1: Understand the concepts of Basic electronics.

CO2: Explain the Semiconductor diode

CO3: Understand the basic electronic measurements and the instruments.

Unit I: Introduction to Electronics & Passive components 12 Hrs.
Evolution and impact of electronics, Passive components, Resistors – specifications, colour coding, preferred values, types; Capacitors – action, specifications, colour coding, reactance and q factor, classification; Inductors - self inductance and mutual inductance, specifications, reactance and q factor, comparison of inductors and capacitors, classification; Transformers - transformer efficiency, classification; Electromechanical components.

(**Book 1, Chapters 0 & 1)**

Unit II: Semiconductor Diodes 10 Hrs.
Energy band diagram, Intrinsic semiconductors, Extrinsic semiconductors, PN junction diode, Breakdown diodes, Varactor diode, Photodiode, Light dependent resistor, Solar cell, Light emitting diode.

(Book 1, Chapter 2)

Unit III: Electronic Measurements and Measuring Instruments 10 Hrs.
Generalized measurement system, Performance and parameters of instruments, Principle of permanent magnet moving coil meter, Galvanometer as ammeter, voltmeter and ohmmeter, Multimeter, Electronic multimeters, Testing of electronic components.

(Book 1, Chapter 6)

Books for Study:

1. Introduction to Electronics Engineering - 5th Edition, Dr. K. Gopakumar (Phasor Books)

Books for Reference:

1. Principles of Electronics - V K Mehta (S Chand & Co.)
2. Basic Electronics – B L Theraja (S Chand & Co.)

3. Basic Electronics – J B Gupta (S K Kataria& Sons)

MARKS INCLUDING CHOICE

Unit	**Marks**
I	12
II	9
III	9

PATTERN OF QUESTIONS

Part A	**Short answer**	(6 questions x Mark 1 = 6)
	Answer all questions	(6 questions x Mark 1 = 6)
Part B	**Short Essay**	(6 questions x Marks 2 each =12)
	Answer any 6 questions	(4questions x Marks 2 each=8)
Part C	**Essay**	(2questions x Marks 6 each =12
	Answer any 4 questions	(1question x Marks 6 each=6)
• **Total marks including choice -30** • **Maximum marks of the course-20**		

MODEL QUESTION PAPERS –UG (PHYSICS)

.I Sem Core

.I Sem Complementary

MODEL QUESTION PAPER
FIRST SEMESTER BSC DEGREE EXAMINATION
PHYSICS CORE COURSE
1B01PHY-MECHANICS I

Time : 3hrs **Max Marks: 40**

PART A

(All questions are compulsory. Each question carry 1 mark)

1. What do you mean by contact forces?
2. The dimensional formula of gravitational field is………………
3. The differential equation for simple harmonic motion is……
4. State law of conservation of linear momentum
5. The value of escape velocity from earth is ………………….
6. Write the equation of motion for a simple pendulum

(6X1 = 6Marks)

PART B

(Answer any 6. Each question carries 2 marks)

Explain inertial system with reference to Newton's first law of motion

7. State and explain Newton's law of gravitation
8. Obtain an expression for fractional change in acceleration due to gravity with altitude
9. State and explain work energy theorem
10. What are conservative forces? Give examples
11. Sketch and explain the energy diagram of a two atom system
12. Show that angular momentum is conserved for a particle in central force motion
13. State and prove parallel axis theorem

(6X2 = 12 Marks)

PARTC

(Answer any 4. Each question carries 3 marks)

14. A Drum Major's Baton consists of two masses m_1 and m_2 separated by a thin rod of length l. the baton is thrown into air. Find the centre of mass and equation of motion for centre of mass of the baton
15. A 5kg mass moves under the influence of a force $F=(4t^2\mathbf{i} - 3t\mathbf{j})$N. It starts from the origin at t=0. Find its velocity and position at t=1s

16. A proton makes a head on collision with an unknown particle at rest. The proton rebounds straight back with 4/9 of its initial kinetic energy. Find the ratio of mass of unknown particle to that of proton assuming the collision to be elastic.
17. A mass 50kg is shot vertically upward from the surface of earth with 500m/s. assuming that the only force is gravity, determine its maximum altitude assuming the value of radius of earth
18. Show that the acceleration of the masses m_1 and m_2 suspended over a pulley of mass m_p in an Atwood's machine is $a=(m_1-m_2)g/(m_1+m_2+m_p/2)$
19. A uniform drum of radius **b** and mass **M** rolls down a plane inclined at an angle θ. Find its acceleration along the plane. The moment of inertia of the drum about its axis is $I_0=Mb^2/2$

(4x3=12 Marks)

PART D

(Answer any 2. Each question carries 5 marks)

20. State Newton's laws of motion. Apply them to find the force on each car of mass M in a string of three freight cars pulled with force F by a locomotive
21. Define potential energy. Obtain potential energies of a uniform force field and an inverse square force
22. Distinguish between elastic and inelastic collision. Discuss elastic collision between two particles in centre of mass system and show that their speeds remain same before and after collision
23. State the law of conservation of angular momentum. Prove that the angular momentum of a rigid body is equal to the sum of the angular momentum about the centre of mass and the angular momentum of the centre of mass about the origin

(2X5 = 10 Marks)

MODEL QUESTION PAPER
FIRST SEMESTER BSC DEGREE EXAMINATION
PHYSICS COMPLEMENTARY ELECTIVE COURSE
1C01PHY: MECHANICS

Time: 3 Hrs **Max Marks: 32**

SECTION A
(Answer all questions, each carries 1 Mark)

1. What are the limiting values of Poisson's ration?
2. If the radius of tube is doubled, the rate of flow increases by............................
3. The radius of gyration of sphere about an axis passing through the tangent..................
4. The basic solution form of simple harmonic oscillator......................
5. The velocity of sound in air is.......................

(5X1 = 5Marks)

SECTION B
(Answer any four questions, each carries 2 Marks)

6. Steel is more elastic than rubber. Explain why?
7. Why should the lubricant oil be of high viscosity?
8. How does soap help us to remove dirt better in washing clothes?
9. State and prove the parallel axes theorem
10. Write the differential equation for a forced harmonic oscillator.
11. Discuss the various modes of vibration in case of an open-end pipe.

(4X2 = 8 Marks)

SECTION C
(Answer any three questions, each carries 3 Marks)

12. Find the amount of work done in twisting a steel wire of radius 1mm and length 20cm through an angle of 45^o. The rigidity modulus of the material of the wire is 8×10^{10} Nm^{-2}
13. Calculate the height to which water at 4^oC will rise in a capillary tube of 1 mm diameter. The surface tension of water is given $0.072Nm^{-1}$.
14. A uniform thin bar of mass 3 kg and length 1.2m is bent to make an equilateral triangle. Calculate the moment of inertia about an axis passing through the centre of mass and perpendicular to the plane of the triangle.

15. Find whether the discharging of a capacitor through inductive circuit is oscillatory, given C= 0.2 μF, L= 10mH and R= 200 Ω.
16. A wire of length 1.5m is stretched by force of 44N. The diameter of the wire is 2mm and its density is 1.4 g/cm^{-3}. Calculate the frequency of fundamental node.

(3X3 = 9 Marks)

SECTION D
(Answer any two questions, each carries 5 Marks)

17. What do you mean by bending moment? Obtain the expression for the bending moment of a beam.
18. Derive an expression for moment of inertia of a solid sphere about the diameter.
19. Discuss the theory of damped harmonic oscillator.
20. Derive an expression for the velocity of a longitudinal wave in gases. Discuss the Laplace's correction to Newton's formula.

(2X5 = 10 Marks)