MULTI-DISCIPLINARY COURSES

SEMESTER I

MDC1 – MULTI-DISCIPLINARY COURSE

KU1MDCSTA141: BASICS OF STATISTICS

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
I	**MULTI-DISCIPLINARY**	100 – 199	KU1MDCSTA141	3	45

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	-	-	25	50	75	1½

Course Description: This course covers fundamental mathematical concepts such as number systems, equations, and progressions, along with an introduction to statistics including data types, measurement scales, and methods of data collection and presentation.

Course Prerequisite: HSE level Mathematics/Statistics Courses

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the concepts and properties of numbers including integers, rational and irrational numbers.	U
2	Apply ratio and proportion concepts in solving real-world problems.	A
3	Demonstrate proficiency in using laws of indices and logarithms in mathematical calculations.	R
4	Solve linear and quadratic equations and apply arithmetic and geometric progressions to practical situations.	E
5	Analyse and interpret statistical data, including differentiating between quantitative and qualitative data types and understanding various measurement scales.	An

Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✔		✔		✔		✔
CO 2		✔	✔		✔		✔
CO 3		✔		✔			✔
CO 4	✔			✔		✔	
CO 5		✔	✔		✔	✔	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Elementary Mathematics – I**	8
	1	Number system – Integers, rational and irrational numbers	
	2	Ratio and proportion	
	3	Laws of indices	
	4	Logarithm	
2		**Elementary Mathematics – II**	7
	1	Equations – Solution of linear and quadratic equations	
	2	Arithmetic and geometric progression	
	3	Simple and compound growth rate	
	4	Profit and loss, Market equilibrium	

3	**Introduction to Statistics**		**8**
	1	Statistics: Definition, nature and scope of statistics in various streams	
	2	Different types of data: quantitative, qualitative, geographical and chronological	
	3	Scales of measurement of data: nominal, ordinal, interval and ratio scale	
	4	Time series, cross sectional and longitudinal data	
4	**Statistical Methods**		**7**
	1	Collection of data: Primary and Secondary and their sources	
	2	Presentation of data: classification and tabulation of data	
	3	Diagrammatic Representation: Line diagram, bar diagrams and pie diagrams	
	4	Graphical presentation: Histogram, frequency polygon, frequency curve and ogives	
5	**Open End**		**15**
	Practical using MS Excel		
	History of Statistics, Data entry using MS Excel, Understanding the usage of various statistical and mathematical functions in Excel, Preparation of diagrams explained in Module 4 by Excel, Preparation and submission of a report.		

Essential Readings:

1. Gupta S. C. and Kapoor, V. K. (2002): ***Fundamentals of Mathematical Statistics***, Sultan Chand & Co.
2. Gupta S. C. (2018): ***Fundamentals of Statistics***, Himalaya Publishing House.
3. B L Agrawal (2013): ***Basic Statistics***, New Age International Publishers.
4. Yule and Kendall (1984): ***An Introduction to the Theory of Statistics***, Charles Gtiffin & Co, London.
5. Spiegel, M.R (2000): ***Theory and Problem of Statistics***, McGraw Hill, London.

Suggested Readings:

1. Mood A. M., Gray bill F. A., Bose D. C. (2007): ***Introduction to the theory of statistics*** - Tata Magraw Hill.

2. Goon A. M., Gupta M. K., Das Gupta. B. (1999): ***Fundamentals of Statistics***, Vol. I, World Press, Calcutta.
3. Croxton. F. E and Cowden. D. J (1973): ***Applied General Statistics***, Printice Hall of India.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**50**
Continuous Evaluation		**25**
a)	Test Paper- 1	**5**
b)	Test Paper-2	**5**
c)	Assignment	**5**
d)	Seminar	**-**
e)	Book/ Article Review	-
f)	Viva-Voce	**-**
g)	Field Report/Practical	**10**
Total		**75**

SEMESTER II

MDC2 – MULTI-DISCIPLINARY COURSE

KU2MDCSTA151: INTRODUCTION TO DATA ANALYSIS

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
II	**MULTI-DISCIPLINARY**	100 – 199	KU2MDCSTA151	3	45

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	-	-	25	50	75	1½

Course Description: This course provides a comprehensive understanding of statistical measures including central tendency, dispersion, correlation analysis, and regression analysis with practical applications and examples.

Course Prerequisite: HSE level Mathematics/Statistics Courses

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand and calculate various measures of central tendency including the arithmetic mean, median, mode, and quartiles, deciles, and percentiles.	U
2	Calculate and interpret measures of dispersion such as range, quartile deviation, mean deviation, standard deviation, and coefficient of variation to assess the spread of data.	R
3	Analyse relationships between variables using correlation techniques including scatter diagrams, Karl Pearson's correlation coefficient, and Spearman's rank correlation coefficient.	An
4	Apply regression analysis techniques to model relationships between variables, including understanding regression types, fitting regression lines, and interpreting regression coefficients.	A
5	Evaluate and interpret statistical summaries obtained from measures of central tendency, dispersion, correlation, and regression analysis to draw meaningful conclusions from data.	E

Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✔		✔			✔	✔
CO 2		✔			✔		
CO 3	✔		✔		✔		✔
CO 4		✔		✔			✔
CO 5	✔		✔		✔		✔

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1	**Measures of Central Tendency**		**8**
	1	Arithmetic mean	
	2	Median	
	3	Mode	
	4	Quartiles, Deciles and Percentiles	
2	**Measures of Dispersion**		**8**
	1	Range	
	2	Quartile deviation	
	3	Mean deviation	
	4	Standard deviation and coefficient of variation	
3	**Correlation Analysis**		**7**
	1	Definition and types of correlation	
	2	Scatter Diagram	
	3	Karl Pearson's correlation coefficient	
	4	Spearman's rank correlation coefficient (without tie)	
4	**Regression Analysis**		**7**
	1	Definition and types of regression	
	2	Regression lines	

	3	Fitting of regression equations, examples	
	4	Properties of regression coefficients	
5	**Open End**		**15**
	Practical using MS Excel		
	Analysis of data using concepts explained in Module 1 to 4 by Ms Excel, Preparation and submission of a report.		

Essential Readings:

1. Gupta S. C. and Kapoor, V. K. (2002): ***Fundamentals of Mathematical Statistics***, Sultan Chand & Co.
2. Gupta S. C. (2018): ***Fundamentals of Statistics***, Himalaya Publishing House.
3. B L Agrawal (2013): ***Basic Statistics***, New Age International Publishers.

Suggested Readings:

1. Mood A. M., Gray bill F. A., Bose D. C. (2007): ***Introduction to the theory of statistics*** - Tata Magraw Hill.
2. Goon A. M., Gupta M. K., Das Gupta. B. (1999): ***Fundamentals of Statistics***, Vol. I, World Press, Calcutta.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**50**
Continuous Evaluation		**25**
a)	Test Paper- 1	**5**
b)	Test Paper-2	**5**
c)	Assignment	**5**
d)	Seminar	**-**
e)	Book/ Article Review	-
f)	Viva-Voce	**-**
g)	Field Report/Practical	**10**
Total		**75**