KU2DSCMAT111
BASIC MATHEMATICS II

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
2	DSC	100-199	KU2DSCMAT111	4	60

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4		1	30	70	100	2

Course Description

This course covers fundamental concepts in mathematics for computer applications, including basics on vectors, basics on probability, reduction formulae for sine, cosine and tangent functions, Fourier series basics and half-range expansions.

Course Prerequisite

Basic awareness of vectors, derivatives and integrals

Course Outcomes

CO No.	Expected Outcome	Learning Domains
1	Understand three-dimensional coordinate systems, properties of vectors and lines and planes in space	Understand
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.	Understand
3	Use integration techniques to trigonometric functions	Understand

4	Comprehend Fourier series	Understand

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	✓						

COURSE CONTENTS

Contents for Classroom Transaction

MODULE	UNIT	DESCRIPTION	HOURS
I	**Vectors and the Geometry of Space**		14
	1	Three-Dimensional Coordinate Systems	
	2	Vectors	
	3	The Dot Product	
	4	The Cross Product	
	5	Lines and Planes in Space (a) Vector and parametric equations for Lines and line segments in space (b) Vector and parametric equations for a plane in space	
II	**Probability**		14
	1	Introduction	
	2	Basic Terminology	
	3	Probability and Set Notations	
	4	Addition Law of Probability or Theorem of Total Probability	
	5	Independent Events	

III	**Integration of Trigonometric functions**		13
	1	Integration of $sin^n x$	
	2	Integration of $cos^n x$	
	3	Integration of $sin^p x\ cos^q x$	
IV	**Fourier Series**		14
	1	Fourier Series, A Basic Example	
	2	Arbitrary Period. Even and Odd Functions.	
V	**Teacher Specific Module**		**5**
	Directions		
	Applications of vectors (Module 1), Half-Range expansions (Module IV)		
	Any topic related to Module I, II, III & IV		

Essential Readings

1. Thomas'Calculus (12th edition), Maurice D. Weir and Joel Hass, Pearson India Education Services.
2. Higher Engineering Mathematics (41st edition), B.S. Grewal, Khanna Publications
3. Integral Calculus, Santhi Narayanan and P.K. Mittal, S. Chand and Co.
4. Advanced Engineering Mathematics (10th edition), E. Kreyszig, Wiley

Reference Distribution

Module	Unit	Reference No.	Section	Remarks
I	1	1	12.1	
	2	1	12.2	
	3	1	12.3	
	4	1	12.4	
	5	1	12.5	*Topics related to distance, lines of intersection and angle between planes are excluded*
II	1	2	26.1	
	2	2	26.2	

	3	2	26.3	
	4	2	26.4	*Proofs are excluded*
	5	2	26.5	*Proofs are excluded*
III	1	3	4.1	*4.1.1 is excluded*
	2	3	4.2	*4.2.1 is excluded*
	3	3	4.3	*4.3.1 is excluded*
IV	1	4	11.1	*Excluded derivation of the Euler formulae and convergence and sum of a Fourier series*
	2	4	11.2	*Half-Range expansion is excluded*

Suggested Readings

1. Naive Set Theory, Paul R. Halmos, Dover Publications Inc. Mineola
2. Elementary number theory, David Burton, Mc Graw Hill
3. Differential and Integral Calculus, S. Narayanan and T.K.M. Pillay, S. Viswanathan Printers and Publishers, Chennai
4. A Textbook of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Pub.

Assessment Rubrics

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper *	12
b)	Assignment	12
c)	Seminar, Viva-Voce	6
Total		**100**

* A student has to appear for at least two written tests. Average mark of best two tests is to be considered for internal mark.

** **Use of Scientific Calculators below 100 functions (that is, upto *fx 99*) shall be permitted.**