MATHEMATICS
COURSE DETAILS

Semester I

KU1DSCMAT101 LOGIC AND SET THEORY

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
1	CORE	100	KU1DSCMAT 101	4	60

Learning Approach (Hours/ Week)		Marks Distribution			Duration of ESE (Hours)
Lecture	Tutorial	CE	ESE	Total	
4	1	50	50	100	3Hr

Course Objectives: The objective is to lay a solid foundation in discrete mathematics, which is crucial for understanding more advanced topics in computer science, mathematics, and other fields.

Course Outcomes: At the end of the Course, the Student will be able to:

SL No	Course Outcomes
CO1	Students will demonstrate proficiency in understanding propositional logic, including the ability to construct truth tables, identify logical equivalences, and apply rules of inference to derive valid conclusions from logical statements
CO2	Students will be able to effectively use predicates and quantifiers to express mathematical statements and translate them into logical forms. They will apply nested quantifiers to formulate complex logical statements and reason about their truth values
CO3	Students will develop competence in set theory, including operations on sets (union, intersection, complement) and the ability to represent set relationships using Venn diagrams. They will solve problems involving set identities and apply set theory concepts to real-world scenarios.
CO4	Students will master the concepts of sequences and sums, including arithmetic and geometric sequences, series, and summation notation. They will apply mathematical induction to prove statements involving sequences and use induction to establish the validity of mathematical propositions

Mapping of COs to PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓	✓	✓	✓	
CO2	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	

COURSE CONTENTS

Module 1: Propositional logic, propositional equivalence, predicates and quantifiers, (Sections 1.1, 1.2,1.3, of the Text Book)

Module 2: Nested quantifiers, rules for inference, sets (Sections 1.4,1.5.2.1, of the Text Book)

Module 3: Set operators, functions (Sections 2.2, 2.3, of the Text Book)

Module 4: Sequences and sums, mathematical induction **(**Sections 2.4, 4.1of the Text Book)

Module X: Get acquainted with the concepts by studying the examples and exercises provided in Reference 1.

Text book: Discrete Mathematics and Its Applications. by Kenneth H. Rosen, 6th edition, McGraw Hill.

Reference Books:

1. Susanna S Epp: Discrete Mathematics with Applications(4/e) Brooks/Cole Cengage Learning (2011) ISBN: 978-0-495-39132-6
2. Kenneth H. Rosen: Discrete Mathematics and Its Applications(7/e) McGraw-Hill, NY (2007) ISBN: 978-0-07-338309-5
3. OScar Levin, Discrete Mathematics: An Open Introduction, 3rd edition.

TEACHING LEARNING STRATEGIES

- Lecturing, Demonstration, Digital Learning, Team Work

MODE OF TRANSACTION

- Lecture, Seminar, Discussion

ASSESSMENT RUBRICS

End Semester Evaluation	50 marks
Continuous Evaluation	
Tests	20 Marks
Assignment	10 Marks

Seminar/Viva	20 Marks
Total	50 Marks

Semester II

KU2DSCMAT101: INTRODUCTION TO MATRIX THEORY, PARAMETRIC EQUATIONS AND POLAR CO -ORDINATES

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
2	CORE	100	KU2DSCMAT 101	4	60

Learning Approach (Hours/ Week)		Marks Distribution			Duration of ESE (Hours)
Lecture	Tutorial	CE	ESE	Total	
4	1	50	50	100	3Hr

Course Objectives: The objective is to provide students with a solid understanding of the fundamental concepts of matrix theory, which are essential in various areas of mathematics, engineering, and applied sciences.

Course Outcomes: At the end of the Course, the Student will be able to:

SL No	Course Outcomes
CO1	Students will demonstrate proficiency in fundamental concepts of matrices and matrix algebra, including operations such as addition, multiplication, and transposition. They will be able to solve systems of linear equations using matrix methods and apply matrix algebra to represent and solve practical problems.
CO2	Students will acquire the ability to compute determinants of square matrices and understand their geometric and algebraic interpretations. They will develop skills in finding the inverse of square matrices and apply these concepts to analyze the properties and behavior of linear transformations.
CO3	Students will gain knowledge of special types of matrices, such as symmetric, skew-symmetric, orthogonal, and diagonal matrices. They will explore applications of matrices in diverse fields, including computer science and statistics
CO4	Students will demonstrate proficiency in parametrizing plane curves, including the ability to represent curves using parametric equations and analyze their geometric properties. They will apply calculus techniques to parametric curves, such as finding derivatives and integrals, and interpret these results in the context of motion and geometry