



# ATMIYA UNIVERSITY

## FACULTY OF SCIENCE

### DEPARTMENT OF COMPUTER APPLICATIONS

#### MASTER OF COMPUTER APPLICATIONS

Course Code	Course Name	Credits
20MCACC101	Discrete Mathematics	05

#### ❖ Aim of the Course:

The goal of this course is to teach you the mathematical fundamentals of linear algebra in a way that illustrates their relevance to computer science. The second goal of this course is to track Graph theoretical concepts which are widely used to study and model various applications.

#### ❖ Course Overview and Context:

The course is divided into five units. The first unit is of introductory nature on matrices and their properties. The second unit is related to find determinant and rank of matrices. Unit-3 is related to relations and their properties. Unit-4 is of introductory nature to lattices and their various properties. The main goal of unit-5 is to understand Boolean algebra and its related topics.

#### ❖ Course Outcomes:

Sr #	Course Outcome	Cognitive Level
1	To understand matrix and their properties	Understand
2	To determine determinant of matrix and to understand different types of matrices.	Understand, Apply
3	To paraphrase the concept of relation and its properties.	Understand,
4	To understand the concept of lattice and its properties and its various application in computer science.	Understand, Apply
5	To understand the concept of Boolean algebra and its properties and its various application in computer science.	Understand, Apply



## ❖ Content of the Course:

### Unit-1 Introduction to Matrices

- Introduction to Matrix
- Types of matrices
- Dimension of matrix
- Matrix addition and multiplication
- Multiplication of matrix with scalar
- Scalar Matrix, Identity Matrix, Triangular, upper triangular and lower triangular matrices
- Symmetric, Skew Symmetric,

### Unit-2 Matrix determinate, eigenvalues and rank

- Determinant of a matrix
- Singular and non-singular matrices
- Minor and co-factors of matrix
- Matrix inverse and its properties
- Hermitian, Skew Hermitian matrices
- Eigenvalue and rank of a matrix

### Unit-3 Relation and Partially Ordering Set

- Introduction to relation
- Reflexive, Symmetric and Transitive Relation
- Equivalence relation and their examples
- Irreflexive and antisymmetric relations
- Partially ordering relation and posets

### Unit-4 Lattice and their properties

- Introduction to Lattice
- Properties of lattice
- Bounded Lattice
- Distributive Lattice
- Complemented Lattice
- Lattice as algebraic structure

### Unit-5 Boolean Algebra

- Introduction to Boolean Algebra
- Boolean Expression
- Sum of product and product of Sum of Boolean expression
- Karnaugh Map



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#### ❖ Learning Resources:

Sr #	Textbook   References   Internet Links
1	Discrete Mathematical Structures with Applications to Computer Science, J. P. Tremblay and Manohar, Tata McGraw-Hill
2	Discrete Mathematical Structure", D. S. Malik, M. K. Sen, Cengage Learning

#### ❖ Assignments (Optional):

Sr #	Description	Available From (Date)	Submission Date
1	Examples on Matrices	After 3 Weeks	Within 10 Days
2	Examples on Lattices and Boolean Algebra	After 6 Weeks	Within 7 Days