

Course Code (BIT-103)

Semester-I

Course Title: Applied Mathematics-I

Total Credits: 06

Course Objective

Demonstrate analytical skills and extensive experience with the tactics of problem solving and logical thinking.

UNIT-I Matrices and Determinants

Introduction, Matrix, Square Matrix, Column Matrix, Row Matrix, Diagonal Matrix, Unit Matrix, Upper triangular and lower triangular matrix, symmetric matrix, skew-symmetric matrix, trace of matrix, transpose of matrix, addition, subtraction and multiplication of two matrices, Minors and Cofactors, Adjoint of a square matrix, Inverse of a matrix. Rank of a matrix, simple applications.

UNIT-II Sets, Relations and functions

Introduction, Basic concepts, Terminology and Notation, Subset, power set, universal set Operation on sets, Algebra of sets, Venn diagram, Multi-Set, Countable and Uncountable sets, ordered pairs, Cartesian product on sets, Computer representation of sets.

Relation on sets, domain, range and co-domain, Types of relations, Properties of relations, Representation of Relations.

Functions introduction, Classification of functions, Types of functions, Composition of functions.

UNIT-III Mathematical Logic

Introduction, propositions, compound proposition, negation, conjunction, disjunction, proposition and truth tables, Logical equivalence, Algebra of propositions, conditional proposition, converse, contra positive and inverse, Bi-conditional statements, Tautology and contradiction, normal forms, disjunctive normal form, conjunctive normal form

UNIT-IV Boolean algebra

Introduction, Boolean algebra as an algebraic structure, Principle of duality, Logic gates, Truth Tables, Boolean Functions, Sum of Products and Product of Sums, De-morgan's Theorem, Karnaugh Map and Applications. (Minimization of Boolean Expressions)

SUGGESTED READING:

- 1) Mathematics Text Books for class XI and XII (J&K BOSE)
- 2) Discrete Mathematics-Swapan Kumar Sarkar (S.Chand)
- 3) Discrete Mathematics-Semyour Lipschutz & Mark Lipson (Tata Mcgraw Hill)
- 4) Discrete Mathematical Structures-Kolman, Busby, Ross, 6th Edition (Pearson)

