

Government PG College, Ambala Cantt
Course File (Session 2023-2024)(Odd SEMESTER)

Name of professor: Deepak Kumar

Class: B.C.A/1st semester

Name of the Course: Mathematical Foundations for Computer Science-I

Course Code: B23-CAP-104

Course Type: CC-M

Syllabus

Unit-I

Sets and their representations, Empty set, Finite and infinite sets, Subsets, Equal sets, Power sets, Universal set, Union and intersection of sets, Difference of two sets, Complement of a set, Venn diagram, De-Morgan's laws and their applications.

Unit-II

An introduction to matrices and their types, Operations on matrices, Symmetric and skew-symmetric matrices, Minors, Co-factors. Determinant of a square matrix, Adjoint and inverse of a square matrix, Solutions of a system of linear equations up to order 3.

Unit-III

Quadratic equations, Solution of quadratic equations. Arithmetic progression, Geometric progression, Harmonic progression, Arithmetic mean (A.M.), Geometric mean (G.M.), Harmonic mean (H.M.), Relation between A.M., G.M. and H.M.

Unit-IV

The concept of differentiation, differentiation of simple functions, Use of differentiation for solving problems related to real-life situations. Differentiation of simple algebraic, trigonometric and exponential functions

Text /Reference Books:

- C. Y. Young (2021). Algebra and Trigonometry. Wiley.

- S.L. Loney (2016). The Elements of Coordinate Geometry (Cartesian Coordinates) (2nd Edition). G.K. Publication Private Limited.
- Seymour Lipschutz and Marc Lars Lipson (2013). Linear Algebra. (4th Edition) Schaum's Outline Series, McGraw-Hill.
- C.C. Pinter (2014). A Book of Set Theory. Dover Publications.
- J. V. Dyke, J. Rogers and H. Adams (2011). Fundamentals of Mathematics (10th Edition), Brooks/Cole.
- A. Tussy, R. Gustafson and D. Koenig (2010). Basic Mathematics for College Students (4th Edition). Brooks Cole

Course Learning Outcomes (CLO):

After learning this course student will be able:

1. Gain the knowledge of set theory, types of sets and operations on sets. Understand various concepts of matrices and determinants, and acquire the cognitive skills to apply different operations on matrices and determinants.
2. Have the knowledge of the basic concepts of complex numbers and acquire skills to solve linear quadratic equations.
3. Gain the knowledge of the concepts of Arithmetic progression, Geometric progression and Harmonic progression, and find A.M., G.M. and H.M. of given numbers.
4. Understand the concept of differentiation
5. * Attain the skills to make use of the learnt concepts of Introductory Mathematics in multidisciplinary learning contexts and to know their applications

Lesson Plan

Scheduled dates	Topic to be covered
September	Sets and their representations, Empty set, Finite and infinite sets, Subsets, Equal sets, Power sets, Universal set, Union and intersection of sets, Difference of two sets, Complement of a set, Venn diagram, De-Morgan's laws and their applications.
October	An introduction to matrices and their types, Operations on matrices, Symmetric and skew-symmetric matrices, Minors, Co-

	factors. Determinant of a square matrix, Adjoint and inverse of a square matrix, Solutions of a system of linear equations up to order 3.
November	Quadratic equations, Solution of quadratic equations. Arithmetic progression, Geometric progression, Harmonic progression, Arithmetic mean (A.M.), Geometric mean (G.M.), Harmonic mean (H.M.), Relation between A.M., G.M. and H.M.
December	The concept of differentiation, differentiation of simple functions, Use of differentiation for solving problems related to real-life situations. Differentiation of simple algebraic, trigonometric and exponential functions