

BC107 --- MATHEMATICS – I

Course Description and Objective:

Objective of the course is to provide basic knowledge in mathematics which is used in several branches of science and engineering. This will form foundation for further study of computer science.

Course Outcomes: After completion of the course student should able to

- Know the basics of matrices and its applications, solving system of equations
- Know about differential equations and its applications
- Know about number theory used in computer science applications

Unit I :

Matrics : Matrix, Types of matrices, Algebraic operations on matrices, Determinants, Elementary row (column) operations, Rank of a Matrix by reducing it to echelon form, Rank of a matrix by normal form, Finding the inverse of a matrix.

Unit II :

Matrics – 2: Homogeneous and non Homogeneous system of equations, Consistency criterion, Characteristic equations, Eigen values, Eigen vectors and properties, Cayley Hamilton theorem (Statement only)

Unit III :

Differentiation & Integration: Implicit function, Formulas in differentiation, product rule, division rule, chain rule, maxima minima of a function. Integration by parts and Integration by substitution.

Unit IV :

Differential Equations: Definition of differential equation, Order and degree of differential equation formation of differential equations. First order first degree differential equations, variable separable, homogenous and non homogenous differential equations.

Unit V :

Number Theory: Divisibility, Division Algorithm, Greatest Common Divisor, Euclid's algorithm to find the G.C.D. of two non-zero integers, Prime and Composite numbers, Unique Factorization theorem, Division of a given number, Euler's ϕ Function

Text Books:

1. Vasishta A R : "Matrices", Krishna Prakashan Mandir (P) Ltd. Meerut, 2010
2. Frank Ayres J R : "Matrices", Schaum series, TMH.

Reference Books

1. Frank Ayres J R : "Differential Equations", Schaum series, TMH.
2. S. Narayana & T. K Manicavachogam Pillay : "Differential Equations", SV Publishers
3. Remedial Mathematics, P. Seshagiri Rao
4. Apostol T M : "Introduction to Analytic Number Theory", Narosa Publishing House
5. Herstein I N : "Modern Algebra".