BC108 --- MATHEMATICS – II

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 about the derivativesof functions of two and several variables partial differential equations and its applications
- Know about Coordinate geometry which is required for computer graphics etc
- Know about Group theory, Group Homomorphisms and graph theory used in computer science applications

Unit I : Partial Differentiation

Functions of two variables, Partial derivatives, Second and higher order derivatives, Maxima and minima, Simple applications, Jacobian.

Unit II : Coordinate Geometry

Coordinate System (2 dimensional), Distance between two points, mid point formula, division in a given ratio, Geometrical representation of rectangle, rhombus, parallelogram, Equation of straight line in different forms, equations of parabola, circle, ellipse.

Unit III : Theory of Groups

Definition of Group, Semigroup, Subgroup, Results on subgroups, Order of an element, Properties, Cyclic groups and related properties, Coset decomposition, Lagrange's theorem and its consequences.

Unit IV : Group Homomorphisms and Rings

Normal subgroups and related results, Quotient group, Group homomorphism, Elementary properties, Kernel of homomorphism, Isomorphism and related results, Rings, Examples, Types of Rings, Fields Examples of Fields.

Unit V : Introduction to Graph Theory

Graph definition, Types of graphs, Subgraph, Handshake theorem, Path, walk, circuit, cycle, Euler cycle, Hamiltonian path etc., Tree, Spanning tree.

Text Books:

1. Vasishta A R : "Modern Algebra", Krishna Prakashan Mandir, 2014
2. T. K Manicavachogam : "Algebra", S V Publishers
3. Chandrasekhar, Mathematical Foundation for Computer Science (For Graph Theory)
4. Remedial Mathematics, P. Seshagiri Rao