

**JIS College of Engineering**  
**(NAAC 'A' Accredited Autonomous Institution)**

**Syllabus for B. Tech (INFORMATION TECHNOLOGY)**  
**2<sup>ND</sup> YEAR 3<sup>RD</sup> SEM**

**Paper Name: Mathematics-III**

**Paper Code: M (IT) 301**

**Contact: 3L+1T**

**Credits: 4**

**Course contents**

**Module I**

**Introduction to Propositional Calculus:** Propositions, Logical Connectives, Conjunction, Disjunction, Negation and their truth table. Conditional Connectives, Implication, Converse, Contrapositive, Inverse, Biconditional statements with truth table, Logical Equivalence, Tautology & Contradiction. 4L

**Algebraic Structures:** Introduction, Binary operation, Groups, Subgroups, Normal Subgroups, Cyclic Groups, Permutation and Symmetric groups. 6L

**Module II**

**Order, Relation and Lattices:** POSET, Hasse Diagram, Minimal, Maximal, Greatest and Least elements in a POSET, Lattices and its properties, Principle of Duality, Distributive and Complemented Lattices. 5L

**Recurrence relations:** Formulation/Modelling of different counting problems in terms of recurrence relations, Solution of linear recurrence relations with constant coefficients (upto second order) by (i) The iterative method (ii) Characteristic roots method (iii) Generating functions method. 5L

**Module III**

**Theory of Probability:** Axiomatic definition of probability. Conditional probability, Independent events and related problems, Baye's theorem (Statement only) & its application. One dimensional random variable, Probability distributions - discrete and continuous, Expectation. Binomial, Poisson, Uniform, Exponential, Normal distributions and related problems,  $t$ ,  $\chi^2$  and F-distribution (Definition only). Transformation of random variables.

## **Module IV**

**Advance Graph Theory:** Planer graph, Dual graph, Chromatic, Chromatic polynomial and its determination, Applications of Graph Colouring. Matching: Definitions and Examples of Perfect Matching, Maximal and Maximum Matching. 10L

### **Suggested Text / Reference Books:**

1. N. Chandrasekaran and M. Umaparvathi, Discrete Mathematics, PHI.
2. Gary Haggard, John Schlipf and Sue Whitesides, Discrete Mathematics for Computer Science, CENGAGE Learning.
3. Gary Chartrand and Ping Zhang – Introduction to Graph Theory, TMH.
4. J.K. Sharma, Discrete Mathematics, Macmillan.
5. Winfried Karl Grassmann and Jean-Paul Tremblay, Logic and Discrete Mathematics, PEARSON.
6. S. K. Chakraborty and B. K. Sarkar, Discrete Mathematics, OXFORD University Press.
7. Gupta S. C and Kapoor V K: Fundamentals of Mathematical Statistics, Sultan Chand & Sons.
8. Mapa S.K. :Higher Algebra (Abstract & Linear), Sarat Book Distributors.
9. Douglas B. West, Introduction to graph Theory, PHI.
10. N.G. Das, Statistical Methods, Tata McGraw Hill.