

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

Syllabus for all B.Tech Streams
1ST YEAR 2ND SEM

Paper Name: Mathematics-II

Paper Code: M 201

Contact: 3L+1T

Credits: 4

Course contents

Module I

Ordinary differential equations (First order): First order and first degree Exact equations, Necessary and sufficient condition of exactness of a first order and first degree ODE (statement only), Rules for finding Integrating factors, Linear equation, Bernoulli's equation, General solution of ODE of first order and higher degree (different forms with special reference to Clairaut's equation), related applications. **10L**

Module II

Ordinary differential equations (Higher order): General linear ODE of order two with constant coefficients, C.F. & P.I., D-operator methods for finding P.I., Method of variation of parameters, Cauchy-Eulerequations, Solution of simultaneous linear differential equations related applications. **10L**

Module III

Basic Graph Theory: Graphs, Digraphs, Weighted graph, Connected and disconnected graphs, Complement of a graph, Regular graph, Complete graph, Subgraph, Walks, Paths, Circuits, Euler Graph, Cut-sets and cut-vertices, Matrix representation of a graph, Adjacency and incidence matrices of a graph, Graph isomorphism, Bipartite graph. Tree, Binary tree, Spanning tree of a graph, Minimal spanning tree, properties of trees, Algorithms: Dijkstra's Algorithm for shortest

path problem, Determination of minimal spanning tree using Kruskal's and Prim's algorithm.

10L

Module IV

Combinatorics: Fundamental Principles, Permutations, Combinations, Binomial coefficients,

Probability: Classical, relative frequency and axiomatic definitions of Probability, Addition rule, Conditional probability, Multiplication rule, Independent events, Total probability, Baye's theorem.

10L

Text / Reference Books:

1. E. Kreyszig, Advanced engineering mathematics (8th Edition), John Wiley, 1999.
2. B.S.Grewal, Higher Engineering Mathematics, Khanna Publications, 2009.
3. R.K.Jain and S.R.K.Iyengar, Advanced Engineering Mathematics, Narosa Pub. House, 2008.
4. W. E. Boyce and R. DiPrima, Elementary Differential Equations (8th Edition), John Wiley, 2005.
5. R.K. Ghosh and K.C.Maity, An Introduction to Differential Equations, New Central Book Agency.
6. V. K. Balakrishnan, Graph Theory, Schaum's Outline, TMH.
7. J. Clark and D. A. Holton, A first course at Graph Theory, Allied Publishers LTD.
8. D. B. West, Introduction to Graph Theory, Prentice-Hall of India.
9. N. Deo, Graph Theory, Prentice-Hall of India.
10. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons.
11. N.G. Das, Statistical Methods, Tata McGraw Hill.
12. J. Bird, Higher Engineering Mathematics (4th Edition, 1st India Reprint), Elsevier, 2006.
13. L. Rade and B. Westergen, Mathematics Handbook: for Science and Engineering (5th edition, 1st Indian Edition), Springer, 2009.