

Mathematics II (Semester 3)

Algebra and Calculus - II

SECTION A:

Differential Calculus: Bounds, limits and continuity, properties of continuous functions, derivatives, Leibnitz: and Rolle's theorems, Lagrange's and Cauchy's mean value theorems, generalized mean value theorems, indeterminate forms, Taylor's and Maclaurin's series.

SECTION B:

Integral Calculus: Anti-derivatives, techniques of integration, Riemann integral, properties of definite: integrals, mean value theorem, reduction formulae, improper integrals and Beta and gamma integrals.

SECTION C:

Differential Equations I: Differential equations, formation and solution, equations of first order, initial and boundary: value problems, various methods of solving first order differential equations: Separable, Exact & Homogeneous equation, integration factor and orthogonal trajectories. Non-Linear First Order Equations, Envelopes and Singular solutions.

SECTION D:

Differential Equations II: Higher order Homogeneous Differential equations with constant coefficients, superposition: of solutions, Cauchy-Euler's equations, systems of two first order linear homogenous equations, nonlinear equations.

Books Recommended:

Adler, F. R. (2005). Modeling the Dynamics of Life Calculus and Probability for Life Science, Second Edition, Thomson Brooks / Cole.

Anton, H. (1997). Elementary Linear Algebra, Eight Edition, John Wiley.

Birkhoff, G. & Rota, G.C. (1989). Ordinary. Differential Equations, Fourth Edition, John Wiley and Sons, New York.

Boyce, W. E. & Prima, R.C. (1992). Elementary Differential Equations and Boundary Value Problems, John Wiley.

Calvert, J. & Voxman, W. (1994). Finite Mathematics, McGraw Hill, N.Y.

Flus, R. (1983). Calculus and Analytic Geometry, Prindle, Weber and Schmidt, Boston, Mass.

Jain, M.K., Iyengam, S.R.K. & Jain, R.K. (1991). Numerical Methods for Scientific and Engineering Computations, Six Edition, Wiley Esastern Ltd.

- Jain, R.K. & Iyengar, S.R.K. (2007). Advanced Engineering Mathematics, Third Edition, Narosa Publishing House, New Delhi.
- Kishan H. (2007). Differential Calculus, Atlantic Publishers and Distributors Pvt. Ltd.
- Kreyszig, E. (2005). Advanced Engineering Mathematics, Ninth Edition, John Wiley.
- O Neil, P.V. (2003). Advanced Engineering Mathematics, Fifth Edition.
- Sharma, A.K. (2007). Linear Transformations, First Edition, Discovery Publishing House, New Delhi.
- Sharma, J. N. (2007). Numerical Methods for Engineers and Scientists, Second Edition, Narosa Publishing House, New Delhi.
- Steward (2002). Precalculus Mathematics for Calculus, Fourth Edition, with CD, Brooks Cole.
- Swokowski, E.W. (2000). Calculus and Analytic Geometry, Prindle, Weber and Schmidt Boston, Mass.
- Talpur, N.M. (1971). Calculus and Analytic Geometry, Ferozesons.
- Thomas & Finney (2005). Calculus and Analytic Geometry, Addison Wesley.
- Thorpe, J. A. & Kumpel, P.G. (1984). Elementary Linear Algebra, Saunders College Publishers, New York.
- Yousuf, S.M. (2003). Mathematical Methods, Fourth Edition, Ilmi Kitab Khana, Lahore.