

NATIONAL INSTITUTE OF TECHNOLOGY RAIPUR

DEPARTMENT OF MATHEMATICS

B.Tech. First Semester

BASIC ENGG. MATHEMATICS – I

(Theory Periods – 40, Tutorial periods - 12)

Unit – I Complex Numbers: De Moivre's theorem; roots of complex numbers; separation into real and imaginary parts of circular, hyperbolic, logarithmic & exponential functions; summation of trigonometric series by C+iS method.

Unit – II Differential Calculus: Successive differentiation, Leibnitz's theorem; expansions of functions in Taylor's & Maclaurin's series; asymptotes; singular points; tracing of simple curves.

Unit – III Integral Calculus: Reduction formulae; application of integration to rectification; quadrature; volume of revolution; integral as the limit of a sum.

Unit – IV Partial Differentiation: Partial derivatives; Euler's theorem on homogeneous functions; total derivative; change of variables; maxima & minima of functions of two variables; Lagrange's method of undetermined multipliers; Jacobians; differentiation under the integral sign.

Unit – V Ordinary Differential Equations & Applications: Exact differential equations; reducible to exact form; first order differential equations (non - linear); application to simple electrical circuit & heat flow; Newton's law of cooling.

TEXT BOOKS:

1. Higher Engineering Mathematics by B.S.Grewal (38th edition)- Khanna Publishers.
2. Advanced Engineering Mathematics by Erwin Kreyszig (8th edition)- John Wiley & Sons.

REFERENCE BOOKS:

1. Differential Calculus by Gorakh Prasad- Pothishala Private Limited.
2. Integral Calculus by Gorakh Prasad- Pothishala Private Limited.
3. Advanced Engineering Mathematics by R.K.Jain & S.R.K. Iyengar- Narosa Publishing House.
4. Applied Mathematics for Engineers and Physicsts by Louis A. Pipes- Mc Graw Hill.

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