

**HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY, PATAN**

**SYLLABUS**

**B. E. COMPUTER ENGINEERING**

**B. E. FIRST YEAR (EC, IT, CE, )**

(Effective From June 2006)

**CE 101: ENGINEERING MATHEMATICS – I & II**

Teaching Scheme		Examination Scheme				
Theory Hrs.	Practical Hrs.	Theory Hrs.	Theory Marks	Pract./ Viva Marks	Term Work Marks	Total Marks
4	---	4	100	---	---	100

**DIFFERENTIAL CALCULUS:**

1. Successive differentiation, Leibnitz Theorem, Taylor's & Maclaurin's expansions, Indeterminate forms.
2. Partial differentiation - Partial and total differential coefficient, Eulers Theorem, Transformations, Geometrical interpretation of partial derivatives, Tangent plane and Normal line, Jacobians, Taylors expansion for two variables, Errors and approximations, Maxima and Minima of functions of two variables, Lagrange's method of undetermined multiple's to determine stationary values.

**INTEGRAL CALCULUS:**

1. Reduction formulae, Beta - Gamma & Error functions, Elliptic functions.
2. Application of integration - Area of a bounded region, Length of a curve, Volume & surface area of a solid of revolution for Cartesian, parametric & polar curves.
3. Multiple integrals: Double integral, change of order of integration, transformation of variables by Jacobean only for double integration, change to polar co-ordinates in double integrals only, Triple integral, Application of multiple integration to find areas, volumes, C.G., M.I. and mean values.

**COMPLEX NUMBERS:**

DeMoivres Theorem & its applications, functions of complex variables-exponential, hyperbolic & inverse hyperbolic, trigonometric & logarithmic

**INFINITE SERIES:**

Definition, Comparison test, Cauche's integral test, ratio test, root-test, Leibnitz rule for alternating series, power series, range of convergence, uniform convergence.

**MATRIX ALGEBRA:**

Elementary transformations & rank, inverse by elementary transformation, normal form of a matrix, consistency of system of linear equations, solution of systems of equations, Linear dependent vectors in  $R^3$ , Linear & orthogonal transformations, Eigen values and Eigen vectors.

**DIFFERENTIAL EQUATIONS & MODELLING:**

Modeling of engineering system (leading to ODE of first order, first degree, including orthogonal trajectories). Exact differential equations and integrating factors, unified approach to solve first order equations, Linear, Reducible to linear, Applications including modeling, solution of first order and higher degree differential equations (clairut's equation only).

**REFERENCE BOOKS:**

1. Elementary Engineering Mathematics by Dr.B.S.Grewal.
2. Higher Engineering Mathematics by Dr.B.S.Grewal.
3. Engineering Mathematics - I. by P.N. & J.N.Wartikar.
4. Engineering Mathematics - I & II. by G.V.Kumbhojkar.
5. Higher Engineering Mathematics by K.R.Kachot