

SARDAR PATEL UNIVERSITY
Syllabus
(With effect from June / July 2007)
MA-151 : Engineering Mathematics - I
B.E. (I)

	L	T	P
Credits (5)	4	1	0

Unit – 1 **(8)**

Differential Calculus and its Applications:

Reorientation of calculus. Differentiation of Hyperbolic and Inverse Hyperbolic functions. Successive differentiation, standard forms, Leibnitz's theorem (without proof) and applications. Taylor's and Maclaurin's series expansion; application to evaluate approximate values of a function, indeterminate forms, L'Hospital rule.

Unit – 2

Tracing of Curves: **(10)**

Tracing of Cartesian, Polar and Parametric form of standard curves.

Reduction formulae of $\int_0^{\frac{\pi}{2}} \sin^n x dx$, $\int_0^{\frac{\pi}{2}} \cos^n x dx$, $\int_0^{\frac{\pi}{2}} \sin^m x \cos^n x dx$ (Statements only)

Applications to find area, volume of standard curves.

Unit – 3 **(8)**

Infinite Series:

Sequence and their convergence, Convergence and divergence of infinite series, Geometric series, p-test, a necessary condition for convergence, Comparison test, ratio test.

Unit – 4 **(8)**

Matrices and its Applications:

Elementary row and column transformation rank of matrix, Solution of homogeneous and non-homogeneous system of linear equation, Linear and orthogonal transformations, Eigen value, Eigen vector.

Unit – 5 **(8)**

Partial Differentiation and its Applications:

Partial and total differential coefficient, Euler's theorem, geometrical interpretation of partial derivative, Jacobians, Taylor's expansion for two variables, errors and approximations, Maxima and minima of function of two variables, Lagrange's method of undetermined multipliers to determine stationary values.

Tutorial :

- This shall consist of problems of at least 20 examples of each unit mentioned above.
- Each unit consists of 2 tutorials.

Reference Books:

- (1) Engineering Mathematics – Vol. I and II - S. S. Sastry, Prentice Hall of India.
- (2) Higher Engineering Mathematics- B S Grewal, Khanna Publishers, New Delhi.
- (3) Advanced Engineering Mathematics – Merle C. Potter, J. L. Goldberg, Adverd F. Aboufabes, Oxford Press.
- (4) Higher Engineering Mathematics- Dr T A Desai, Prin. G. C. Patel, Atul Publishers, Ahemdabad.
- (5) Engineering Mathematics- R B Gandhi, M E Shimpi, V R Shah, K R Parikh, S R Patel & M D Patel, Roopal- Nirav Prakashan, Vallabh Vidyanagar.
- (6) New Engineering Mathematics, Vol. I, A. Chandrababu, C. R. Seshan, Narosa Publishing House.
- (7) Higher Engineering Mathematics, Dr. K.R. Kachot, Mahajan Publishers, Ahmedabad.