First year of Five Years integrated M. Sc. (Physics / Chemistry / Mathematics)

M.Sc. - I, Semester – I	**L**	**T**	**P**	**C**
MM 101 : Mathematics – I	**3**	**2**	**0**	**5**

- **CALCULUS** **(07 Hours)**
  Reorientation of calculus. Differentiation of Hyperbolic and Inverse Hyperbolic functions. Successive Differentiation, standard forms, Leibnitz's theorem and applications, Power series, Expansion of functions, Taylor's and Maclaurin's series.
- **APPLICATIONS OF DERIVATIVES** **(08 Hours)**
  Curvature, Radius of curvature, Cartesian, polar parametric curve with application in Engineering problems. Indeterminate forms, L'Hospital's rules.
- **ORDINARY DIFFERENTIAL EQUATION** **(08 Hours)**
  Reorientation of differential equation, Exact differential equation and Integrating factors, First order and higher degree ode, solvable for p, y and x, Modeling of Real world problems particularly Engg. System, spread of epidemic, spread of new technological innovations, RC and RL network.
- **CURVE TRACING** **(05 Hours)**
  Cartesian, polar and parametric form of standard curves.
- **BETA AND GAMMA FUNCTION** **(04 Hours)**
  Beta and Gamma function with their properties and duplications formula without proof
- **APPLICATION OF DEFINITE INTEGRATION** (**05 Hours)**
  Area, arc length, surface area by revolving curve, volume by revolving area bounded by curve for Cartesian, polar and parametric curves
- **MATRICES** **(07 Hours)**
  Elementary row and column transformation, rank of matrix, Linear dependence, consistency of linear system of equations, characteristic equation, Caley-Hemilton theorem, Eigen value, Eigen vector.

(Total Contact Time (Theory) : 44 Hours)

BOOKS RECOMMENDED :

1. **Steward James De,** *Calculas,* Thomson Asia, Singapore, 2003.
2. **Bali and Iyengar**., *Engg. Mathematics*, Laxmi Publications, New Delhi, 1997.
3. **Peter O'Neil**., *Advanced Engg. Mathematic*', Thompson, Singapore, Ind. Ed. 2002.
4. **Kapur J. N.** , *Mathematical Models in Biology and Medicine,* East west Press, New Delhi 1985.
5. **Hilderband F. B.**, *Methods of Applied Mathematics*, McGraw Hill, New York, 1968.