

## **SYLLABUS OF FOUNDATION COMPULSORY COURSES OF MATHEMATICS**

Course No.	Title of the Course	Course Structure	Pre-Requisite
FCMT007	Mathematics II	3L-1T-0P	None
<b>COURSE OUTCOMES (CO)</b> <ol style="list-style-type: none"> <li>1. Ordinary Differential Equations,</li> <li>2. Partial Derivatives, Maxima and Minima for functions of two or more variables,</li> <li>3. Evaluation of double and triple integral,</li> <li>4. Concept of Numerical Methods and its Applications,</li> <li>5. Concept of Probability and Statistics and its Applications.</li> </ol>			
<b>COURSE CONTENT:</b> <b>Ordinary Differential Equations:</b> Second & higher order linear differential equation with constant coefficients, general solution of homogenous and non-homogenous equations, Euler-Cauchy equation, Series solution by Frobenius method.  <b>Function of Several Variables:</b> Partial Derivatives, Euler's Theorem, Total differentiations, Change of Variables, Jacobian and its basic properties, Taylor's theorem, Maxima and Minima for functions of two or more variables, Lagrange's method of undetermined multipliers.  <b>Multiple Integrals:</b> Evaluation of double integral (in Cartesian and polar co-ordinates), change of order of integration, change of variables. Triple integral (in Cartesian) and its applications. Gamma and beta function.  <b>Numerical Methods:</b> Solution of system of linear equations using Gauss elimination method, LU decomposition method Gauss Seidel iteration method, Solution of polynomial and Transcendental equations by Newton-Raphson method, Numerical Integration by trapezoidal rule and Simpson's 1/3 and 3/8 rule, Numerical Solutions of first order ordinary differential equations: Euler's method, Runge-Kutta method of fourth order.  <b>Probability and Statistics:</b> Conditional probability, Random Variables, Probability distribution functions-binomial, Poisson, exponential, uniform and normal distributions; Correlation, rank correlation and regression analysis; Sampling Theorem.			
<b>Recommended Books:</b> <ol style="list-style-type: none"> <li>1. Calculus and Analytic Geometry by G.B. Thomas (Pearson Education)</li> <li>2. Advanced Engineering Mathematics by Erwin Kreyszig (Wiley Publication)</li> <li>3. Advanced Engineering Mathematics by Michael Greenberg (Pearson Education)</li> <li>4. Advanced Engineering Mathematics by R. K. Jain and S.R.K. Iyenger (Narosa Publication)</li> <li>5. Higher Engineering Mathematics by B. S. Grewal (Khanna Publication)</li> <li>6. Probability and Statistics for Engineers by Anthony J. Hayter (Cengage Learning)</li> <li>7. Numerical Methods for Scientific and Engg. Computations by M. K. Jain, S. R. K. Iyenger and R. K. Jain, (Wiley Eastern Ltd.)</li> </ol>			