

MA -111: APPLIED MATHEMATICS-I**TEACHING AND EXAMINATION SCHEME:**

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

COURSE CONTENTS:

Unit	Content	No. of Hours
I	Sequences and Series: Introduction to sequences and Infinite series, Tests for convergence/divergence, Limit comparison test, Ratio test, Root test, Cauchy integral test, Alternating series, Absolute convergence and conditional convergence. Series Expansions: Power series, Taylor & Maclaurin's series, Convergence of Taylor series, Taylor & Maclaurin's Theorem, Error estimates (one variable)	9
II	Calculus: Mean value theorem, Rolle's theorem, Lagrange's Cauchy mean value theorem, Application of definite integral to evaluate areas of bounded region, Arc length of a plane curve, volume of solids, surface areas of a solid revolution (Cartesian coordinates), Improper integrals, Beta and Gamma functions	9
III	Partial Differentiation and applications: Functions of several variables, Limits and continuity ($\delta - \epsilon$ approach), Partial derivatives, Euler's theorem (Homogeneous functions), Chain rule, change of variables, Jacobian, Maxima and minima by using second order derivatives, Lagrange's method of multipliers, Taylor's & Maclaurin's Theorem, Error estimation.	9
IV	Multiple Integrals and applications: Double integral, change of order of integration in double integral, Polar coordinates, graphing of polar curves, Change of variables (Cartesian to polar), Applications of double integrals to areas and volumes, evaluation of triple integral.	9

Textbooks:

1. Thomas, G.B. and Finney, R.L., Calculus and Analytic Geometry, Pearson Education (2007), 9th ed.
2. Stewart James, Essential Calculus; Thomson Publishers (2007), 6th ed.
3. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics (2003), 2nd ed.

Reference Books:

1. Wider David V, Advanced Calculus: Early Transcendentals, Cengage Learning (2007).
2. Apostol Tom M, Calculus, Vol I and II, John Wiley (2003).
3. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons (2011) 9th Edition