MA-111 Applied Mathematics-I							
Teaching Scheme			Credit	Marks Distribution			Duration of End Semester Examination
L	T	P		Internal Assessment	End Semester Examination	Total	
3	1	0	4	Maximum Marks: 40	Maximum Marks: 60	100	3 Hours
				Minimum Marks: 16	Minimum Marks: 24	40	

Guidelines for setting Question Paper: Question paper of end semester examination will be of 60 marks. The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have 2 questions of 12 marks each (Each subdivided into at least two equal sub-parts) and section E has short answer type questions consisting of six parts of 02 marks each or twelve parts of 01 marks each. The candidate will attempt five questions in all, i.e one question each from sections A, B, C, D and the section E will be compulsory. In the question paper, the questions available in sections A, B, C and D will be covered from Unit-I, Unit-II, Unit-III and Unit-IV respectively and section-E will cover whole syllabus

Course Contents:

Unit-I:
Linear Algebra: Review of matrices, Row reduced echelon form, Inverse using Gauss Jordan method and rank of a matrix, Solution of linear system of equations; Gaussian elimination, LU decomposition method. Vector space, subspaces, Linear dependence & Independence of vectors, basis and dimension, rank-nullity theorem, Eigen values, Eigen vectors, diagonalization. Cayley Hamilton Theorem (without proof), quadratic & canonical forms.
Unit–II:
Calculus: Rolle's theorem, Lagrange's mean value theorem (without proof), improper integrals, beta and gamma functions. Functions of several variables, Limits and continuity, partial derivatives, total derivative, Euler 's theorem, Jacobian, maxima and minima, Lagrange 's method of multipliers, Taylor 's & Maclaurin 's Theorem.
Unit–III
Multiple Integrals: Double integral, change of order of integration, Polar coordinates, graphing of polar curves, Change of variables, Applications of double integrals to areas and volumes, evaluation of triple integral.
Unit-IV:
Functions of Complex variables: Introduction to elementary complex functions (exponential, trigonometric & hyperbolic, inverse trigonometric & hyperbolic, logarithmic), Analytic functions, Cauchy-Riemann equations. **Complex integration:** Cauchy's theorem, Cauchy's integral formula, Taylor's & Laurent's series, zeros & singularities, Cauchy's residue theorem.

Textbooks:

- B. S. Grewal, Higher Engineering Mathematics by B. S. Grewal 43rd Edition (2015)
- Thomas, G.B. and Finney, R.L., Calculus and Analytic Geometry, Pearson Education (2007),9thed.
- Stewart James, Essential Calculus; Thomson Publishers (2007), 6th ed.
- R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics (2003), 2nd ed.

Reference Books:

- Wider David V, Advanced Calculus: Early Transcendentals, Cengage Learning (2007).
- Apostol Tom M, Calculus, Vol I and II, John Wiley (2003).
- H.K. Dass and Rajnish Verma, —Engineering Mathematic, S. Chand Publications.
- Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons (2011) 9th Edition.

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