

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE-I Year (Common to all branches) (Part-Time)			
Subject Code & Name	Instructions Hours per Week			Credits			
	L	T	P	L	T	P	Total
AMP1C1: Applied Mathematics-I	2	1	0	2	1	0	3
Duration of Theory Paper: 3 Hours							

**Course Objectives:** To introduce the mathematical concepts of calculus for solving engineering problems that shall be used in various branches of engineering.

**Prerequisite(s):** Applied Mathematics-I

### COURSE OF CONTENTS

#### UNIT-I

Differential Calculus: Review of Successive differentiation, Leibnitz theorem and problems; Expansion of functions by Taylor's and Maclaurin's Theorem; Asymptotes; Curvature in Cartesian and Polar Coordinates; Envelopes; Evolutes and Involutives.

#### UNIT-II

Advanced Differential Calculus: Function of Several Variables; Partial Differentiation; Approximations and errors; Jacobians; Taylor's Series of Two Variables; Maxima and Minima of Function of Two and More Variables; Lagrange's Method of Undetermined Multipliers.

#### UNIT-III

Integral Calculus: Beta and Gamma functions; detailed study of tracing of curves-Cartesian, polar and parametric curves; Area; Length of Curve; Volume; Surface of Revolution; Theorems of Pappus and Guldin and problems.

#### UNIT-IV

Advanced Integral Calculus: Multiple integrals: Double and Triple Integration; Change of Order of Integration; Area; Volume; Centre of Gravity; Moment of Inertia.

#### UNIT-V

Vector Calculus: Differentiation of a Vector; Gradient; Divergence; Curl; Integration of a Vector Function; Gauss's, Green's and Stoke's Theorems.

#### BOOKS RECOMMENDED

- [1] B.S.Grewal, Engineering Mathematics, 39/e, Khanna Publishers, 2006.
- [2] Erwin. Kreyszig, Advanced Engineering Mathematics, 8<sup>th</sup> edition, John Willy and sons Publications, 1999.
- [3] Ramana B V, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2006.
- [4] C.Ray Wylie & Louis C. Barretle, Advanced Engineering Mathematics, Tata McGraw Hill Publishing Co. Ltd., 6/e, 2003.
- [5] H.K.Das, Higher Engineering Mathematics, S.Chand New Delhi.
- [6] E Mendelson, G J Hademenos, F Ayres, Schaum's Easy Outline: Calculus, McGraw-Hill, 2000.
- [7] R C Wrede, M Spiegel, Schaum's Outline of Advanced Calculus, 2/e, McGraw-Hill, 2002.