



Course Number and Title	: AMS2312, Higher Mathematics
Credits	: 03
Class/Year/Semester	: B.Tech. (Mechanical/ Automobile) /II Year/Odd
Course Category	: Departmental Core
Pre-requisite(s)	: NIL
Contact Hours (L-T-P)	: 2-1-0
Type of Course	: Theory
Course Assessment	: Course Work (Home Assignment) (15%) Mid Semester Examination (1 hour) (25%) End Semester Examination (2 hour) (60%)

Course Objectives:

To learn functions of complex variable, vector differentiation & vector integration.

Course Outcomes: After completing this course the students are expected to be able to:

1. understand and apply fundamental concepts of functions of complex variable and complex integration to various problems.
2. understand the series expansion and evaluate the real integrals by contour integration.
3. apply tools of vector differentiation and integration in the relevant field.

Syllabus:

Units	Contents	Contact Hours
Unit-1	<u>Functions of Complex Variable:</u> Analytic functions, Cauchy-Reimann equations, complex integration, Cauchy's theorem, Cauchy integral formula, Cauchy integral formula for higher order derivatives.	12
Unit-2	<u>Series and Contour Integration:</u> Taylor's series, Laurent's series, zeros and singular points, residues and residue theorem, evaluation of real integrals by contour integration.	12
Unit-3	<u>Vector Differentiation and Integration:</u> Scalar field and vector field, Gradient, Divergence & Curl and their physical significance, solenoidal and irrotational field, line integral, surface and volume integrals, Gauss Divergence theorem, Green's theorem in a plane and applications	12
	Total:	36

Text Books:

1. Chandrika, Prasad: Mathematics for Engineers, Pothishala Pvt. Ltd
2. Jain, R.K and. Iyengar, S.R.K: Advanced Engineering Mathematics, Narosa

Reference Books:

3. Kreyszig, Erwin: Advanced Engineering Mathematics, John Wiley & Sons, Inc.
4. Venkataraman, M.K: "Engineering Mathematics". 3rd year, National Publishing Co., Madras.