Department of Applied Mathematics

BOS:7.4.18
2018-19

Course Number and Title	:	**AMS-2610, Higher Mathematics**
Credits	:	04
Class/Year/Semester	:	**B. Tech.(Computer)/II Year/Autumn**
Course Category	:	Departmental Core
Pre-requisite(s)	:	NIL
Contact Hours (L-T-P)	:	3-1-0
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 mathematical tools in functions of complex variables, complex integration and vector calculus.

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

1. understand and apply the basic of complex variables, functions and complex integration to various engineering problems.
2. understand the basic concepts of zeroes and singular points and evaluate the real integrals by contour integration.
3. apply tools of vector differentiation in the relevant field.
4. apply tools of vector integration in the relevant field.

Syllabus:

Units	Contents	Contact Hours
Unit-1	**Functions of a complex variable:** Analytic functions, Cauchy-Riemann equations, Complex integration, line integrals, Cauchy's theorem, Cauchy's integral formula.	12
Unit-2	**Series and Contour Integration**: Taylor's series, Laurent's series, zeros and singular points, residues and residue theorem, evaluation of real integrals by contour integration.	12
Unit-3	**Vector Differentiation**: Gradient of a scalar field and its physical significance. Divergence and curl of vector field and their physical significance, solenoidal and irrotational fields, determination of potential functions.	12
Unit-4	**Vector Integration:** Integration of vector functions, line integrals, conservative fields, surface and volume integrals, Gauss divergence theorem, Stokes' theorem, Green's theorem, applications.	12
	Total:	**48**

Text Books:

1. Chandrika, Prasad: "Mathematics for Engineers."Pothishala, Allahabad.
2. Chandrika, Prasad: "Advanced Mathematics for Engineers." Pothishala , Allahabad..

Reference Books:

3. Kreyszig, Erwin:"Advanced Engineering Mathematics". John Wiley & Sons, Inc.
4. Jain, R.K and Iyenger, S.R.K: "Numerical Methods for Scientific and Engineering Computations", New Age International Publication.