DIP - MATHEMATICS

III Semester (Lateral entry students): Common for all branches

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
ADPD02	MC	-	-	-	-	-	-	-
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 45		

Prerequisite: Basic principles of algebra and calculus.

I. COURSE OVERVIEW

This course is a foundation for all engineering branches. It includes concepts of matrices, Eigen values, Eigen vectors, multiple integrals, vector calculus and partial differential equations. This course is applicable for simulation, colour imaging processing and optimal solutions in all engineering problems.

II. COURSE OBJECTIVES:

The students will try to learn:

I. The concept of the rank of a matrix, eigen values, eigen vectors and solution of the system of linear equations.
II. Multiple integration to evaluate mass area volume of the plane.
III. Analyze gradient, divergence and curl and evaluate line, surface, volume integrals over a vector field.

III.COURSE SYLLBUS:

Module-I: MATRICES (09)

Rank of a matrix by echelon form and normal form; inverse of non-singular matrices by Gauss-Jordan method system of linear equations: solving system of homogeneous and non-homogeneous equations.

Module-II: EIGEN VALUES AND EIGEN VECTORS (09)

Eigen values; Eigen vectors and their properties (without proof); Cayley-Hamilton theorem (without proof), verification; finding inverse and power of a matrix by Cayley-Hamilton theorem; diagonalization of a matrix

Module-III: MULTIPLE INTEGRALS (09)

Double and Triple integrals; Transformation of coordinate system; Finding the area of a region using double integration and volume of a region using triple integration.

Module-IV: VECTOR CALCULUS (09)

Line integral, surface integral and volume integral; Vector integral theorems: Green's theorem in a plane, Stoke's theorem and Gauss divergence theorem without proofs.

Module-V: PARTIAL DIFFERENTIAL EQUATIONS AND APPLICATIONS (09)

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions, solutions of first order linear equation by Lagrange method.

IV. Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.
2. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
3. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

V. Reference Books:

1. Erwin Kreyszig, "Advanced Engineering Mathematics", John Wiley & Sons, 9th Edition, 2006.
2. Veerarajan T., "Engineering Mathematics for first year", Tata McGraw-Hill, New Delhi, 2008.
3. D. Poole, "Linear Algebra: A Modern Introduction", Brooks/Cole, 2nd Edition, 2005.
4. Dr. M Anita, Engineering Mathematics-I, Everest Publishing House, Pune, First Edition, 2016.

VI. Web References:

1. http://www.efunda.com/math/math_home/math.cfm
2. http://www.ocw.mit.edu/resources/#Mathematics
3. http://www.sosmath.com/
4. http://www.mathworld.wolfram.com/

VII. E-Text Books:

1. http://www.e-booksdirectory.com/details.php?ebook=10166
2. http://www.e-booksdirectory.com/details.php?ebook=7400re