

## TEACHING AND EXAMINATION SCHEME:

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D	C	Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

## COURSE CONTENTS:

Unit	Content	No. of Hours
I	<b>Linear Algebra:</b> Review of matrices, Row reduced echelon form, Inverse using Gauss Jordan method and rank of a matrix, Solution of system of linear equations, Linear spaces, Subspaces, Basis and dimension, rank -nullity theorem, Linear transformation and its matrix representation, Eigen values, Eigen vectors and Diagonalization, Cayley-Hamilton Theorem (without proof), and Quadratic form and Orthogonal transformation.	9
II	<b>Ordinary Differential Equations:</b> Review of first order differential equations, Exact differential equations, Second and higher order linear differential equations with constant coefficients, Cauchy's & Legendre's homogeneous differential equations, Variation of parameters method, Cauchy - Euler equation, Method of undetermined coefficients, Engineering applications of differential equations.	9
III	<b>Laplace Transform:</b> Definition and existence of Laplace transforms and its properties, Inverse Laplace transforms using partial fraction, properties and convolution theorem (without proof), Laplace and inverse Laplace transforms of Unit step function and Impulse function, Applications to solve initial and boundary value problems.	9
IV	<b>Fourier Series:</b> Introduction, Fourier series on arbitrary intervals, Even Odd functions, Half range expansions, Parseval's theorem, Complex Fourier series, Harmonic analysis. <b>Vector calculus:</b> Introduction to vectors, Vector addition and multiplication, Directional derivatives, gradient, divergence & curl with properties, Scalar line integrals, vector line integrals, scalar surface integrals, vector surface integrals, Green, Stokes and Gauss divergence theorem (without proof).	9

## Text Books:

1. R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics (2003), 2nd ed.
2. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers.
3. H.K. Dass and Rama Verma, "Engineering Mathematics", S. Chand Publications.

## Reference Books:

1. N.P. Bali and Manish Goel, "Engineering Mathematics", Laxmi Publications
2. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill Education Pvt.Ltd., New Delhi