Program: **Bachelor's Degree** Class: **UG**	Year: **Third**	Semester: **V**
Subject: **Mathematics**		
Course Code: **MN-1C**	Course Title: **Vectors**	

Course Learning Outcomes: This course will enable the students to:

a) Understand the concepts of scalar & vector products of three and four vectors.
b) Understand the concept of vector function of scalar variable t, Scalar point functions, vector point functions, Grad, Curl and Divergence.
c) Inter-relationship amongst the line integral, double and triple integral formulations
d) Realize importance of Green, Gauss and Stokes' theorems in other branches of mathematics.

Credit: **4 (Theory)**	**Compulsory**	
Full Marks: **75**	Time: **3 Hours**	
Unit	**Content**	**Hours**
I	**Product of three & four vectors:** Product of 3 & 4 vectors, Reciprocal system of vectors, Lami's theorem, $\lambda - \mu$ theorem, work done, Moment of force. Couple.	**15 h**
II	**Vector Differentiation:** Vector function of scalar variable t, it's derivative and geometrical meaning, Derivative of product of two and three vectors	**15 h**
III	**Grad, Divergence & Curl:** Scalar point function and vector point function, grad, divergence and curl, their expansion formulae and properties.	**15 h**
IV	**Green's, Stoke's & Gauss's Divergence theorem:** Line integrals, Applications of line integrals: Mass and Work, Fundamental theorem for line integrals, Conservative vector fields, Green's theorem, Area as a line integral, Surface integrals, Stokes' theorem, The Gauss divergence theorem.	**15 h**

Sessional Internal Assessment (SIA) Full Marks 25 Marks
A Internal written Examination 20 Marks (1 Hr)
B Over All Performance including Regularity 05 Marks

Books Recommended:

1. Advanced Engineering Mathematics (10th edition). Erwin Kreyszig, Wiley
2. Vector Analysis: Lalji Prasad, Paramount