

Subject Code: 2SC1040101	Subject Title: Mathematics
Course Type: Core Course	

Course Objective:

This course is designed to enable students to acquire the understanding and practice the applications of Vector Analysis and Different types of Co-ordinates, Matrices, Differentiation and Successive Differentiation.

Teaching scheme (hours) per week		Credit			Theory Marks		Practical Marks		Total
Theory	Tutorial	Theory	Tutorial	Total	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
6	0	6	0	6	105	45	--	--	150

Subject Contents			
Unit No.	Topic	Total Hours	Weight (%)
1	Vector Analysis and Different types of Co-ordinates: (a) Vector Analysis: scalar and vector product of three vectors, product of four vectors, reciprocal vectors, vector gradient, differentiation, divergent and curl. (b) Polar co-ordinates, spherical and cylinder co-ordinates and their relations.	18	25
2	Matrices: Introduction on of matrices, different types of matrices, operations on matrices, theorems on matrices, Symmetric and skew-symmetric matrices, Hermitian and skew- Hermitian matrices, linear dependence and in dependence of row and column matrices. Row rank, Column rank and rank of matrix, Row reduced Echelon form of a matrix and matrix inversion using it.	18	25
3	Differentiation: Definition of derivatives of function $f(x)$, Derivative of definition. Derivatives of function of the type x^n , e^x , a^x and $\log x$ (without proof). Rules of differentiation (without proof). Logarithmic differentiation. Maxima and Minima. Cases of one variable involving second order derivative.	18	25
4	Successive Differentiation: Successive Derivatives, Some standard results for n^{th} derivatives, Leibnitz's theorem and its examples. Cauchy's Mean Value Theorem. Taylor's Theorem (without proof), Maclaurians series (without proof) and its examples. Expansion of power series of $\sin x$, $\cos x$, e^x .	18	25

Course Outcome:

- After successfully completion of the course, the student will be able to ...
- Know about gradient, divergent and curl
- Relation between Polar, Spherical and cylinder coordinates.
- Understanding the application of Matrices.
- Practice the applications of Differentiation.
- Find the n^{th} derivative of a function as well as the n^{th} derivative of the product of two functions

List of References:

- 1) Differential Calculus, by Shantinakaran.
- 2) Vector Analysis, by Murry R. Spiegel.
- 3) Vector Analysis, by Dr.K.S.Rawat,SARUP& SONS,DELHI.
- 4) Business Statistics, by Sudhir Prakashan, Ahmedabad.
- 5) Introduction to Vector Analysis, Fifth Edition, by Herry F. Davis, Arther David Saider.
- 6) Matrix Operation, by Schaum's Series McGRAW-HILL Book Co.