

MTH 211.3 Engineering Mathematics III (3- 2 -0)

	Theory	Practical	Total
Sessional	50	-	50
Final	50	-	50
Total	100	-	100

Course Objectives:

The main objectives of this course is to provide the basic concepts of linear algebra, vector calculus, infinite and Fourier series which are accepted as basic tools of engineering courses.

Course Contents:

1. Linear Algebra: (15 hrs)

Review of definitions and basic properties of matrices and determinants, Rank of a matrix, System of linear equations, Inverse of a matrix, Cramer's rule. Eigen values and Eigen vectors, Introduction to vector spaces and linear transformation.

2. Vector Calculus: (17 hrs)

Scalar and vector field, Differentiation and integration of vector function of a scalar variable, Gradient of a scalar field, Directional derivatives, Divergence and curl of a vector field, Line integral, Surface and volume integral, Divergence theorem, Green's theorem, Stokes's theorem, and their application.

3. Infinite Series: (8 hrs)

Definitions of sequence and infinite series, The necessary condition for convergence of an infinite series, Test of convergence, Alternating series test, Definition of power series and its interval of convergence. Expansion of functions using Taylor's and Maclaurin's theorems.

4. Fourier Series: (5 hrs)

Periodic function, Trigonometric series, Fourier series of the functions of period 2π , Euler's formula, Fourier series of a function having arbitrary period, Even and odd functions and their Fourier series, Half range functions.

Reference Books:

1. Thomas and Finney, *Calculus and Analytic Geometry*, Addison-Wesley, ISBN: 81-780816-01.
2. E. Kreyszig, *Advanced Engineering Mathematics*, Wiley-Eastern Publication, New Delhi, 1990.
3. Chandrika Prasad, *Mathematics for Engineer*, Prasad Mudranalaya, Allahabad, 1996.

