

# SYLLABUS

## REAL ANALYSIS-II

### UNIT - I

(i) **Differentiation** : Differentiation of vector-valued functions.

(ii) **Functions of Several Variables** : The space of linear transformations on  $\mathbb{R}^n$  to  $\mathbb{R}^m$  as a metric space. Differentiation of a vector-valued function of several variables. The inverse function theorem. The implicit function theorem.

(iii) **Lebesgue Measure** : Introduction, Outer measure, Measurable sets and Lebesgue measure. A non-measurable set, Measurable functions, Littlewood's three principles.

### UNIT - II

(iv) **The Lebesgue Integral** : The Lebesgue integral of a bounded function over a set of finite measure. The integral of a non-negative function. The general Lebesgue integral, Convergence in measure.

(v) **Differentiation and Integration** : Differentiation of monotone functions. Differentiation of an integral. Absolute continuity. Convex functions.