B.A/ B.Sc	Semester-IV	Credits:4
Course:4	MATHEMATICS REAL ANALYSIS	Hrs/Weak:5

Course Outcomes:
After successful completion of this course, the student will be able to
- get clear idea about the real numbers and real valued functions.
- obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence/ series.
- Test the continuity and differentiability and Riemann integration of a function.
- Know the geometrical interpretation of mean value theorems.

UNIT I:(12 Hours)
Introduction of Real Numbers (No question is to be set from this portion)
Real Sequences: Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence. The Cauchy's criterion, properly divergent sequences, Monotone sequences, Necessary and Sufficient condition for Convergence of Monotone Sequence, Limit Point of Sequence, Subsequences , Cauchy Sequences – Cauchy's general principle of convergence theorem.

UNIT II:(12 Hours)
INFINITIE SERIES :
Series : Introduction to series, convergence of series. Cauchy's general principle of convergence forseries tests for convergence of series, Series of Non-Negative Terms.
1. P-test
2. Cauchy's n^{th} root test or Root Test.
3. D'-Alemberts' Test or Ratio Test.
4. Alternating Series – Leibnitz Test.

UNIT III:(12 Hours)
CONTINUITY:
Limits: Real valued Functions, Boundedness of a function, Limits of functions. Some extensions of the limitconcept, Infinite Limits. Limits at infinity. (No question is to be set from this portion).
Continuous functions: Continuous functions, Combinations of continuous functions, Continuous Functionson interval.

UNIT IV:(12 Hours)
DIFFERENTIATION AND MEAN VALUE THEOREMS: The derivability of a function, on an interval, at a point, Derivability and continuity of a function, Graphical meaning of the Derivative, Mean valueTheorems; Rolle's Theorem, Lagrange's Theorem, Cauchy's Mean value Theorem
UNIT V:(12 Hours)
RIEMANN INTEGRATION : Riemann Integral, Riemann integral functions, Darboux theorem. Necessary and sufficient condition for R – integrability, Properties of integrable functions, Fundamental theorem of integral calculus, First mean value Theorem.

Co-Curricular Activities(15 Hours)
Seminar/ Quiz/ Assignments/ Real Analysis and its applications / Problem Solving.
TEXT BOOK:
1. Introduction to Real Analysis by Robert G.Bartle and Donlad R. Sherbert, published by JohnWiley.

REFERENCE BOOKS:

1. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, published by S. Chand &Company Pvt. Ltd., New Delhi.
2. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghania,published by S. Chand & Company Pvt. Ltd., New Delhi.