## 1.3 Real Analysis

(w.e.f. academic year 2020-21)

**DSC-1C**                                                                 **BS:301**

Theory: 5 credits and Tutorials: 0 credits
Theory: 5 hours /week and Tutorials: 1 hours /week

**Objective:** The course is aimed at exposing the students to the foundations of analysis which will be useful in understanding various physical phenomena.
**Outcome:** After the completion of the course students will be in a position to appreciate beauty and applicability of the course.

### Unit- I
**Sequences:** Limits of Sequences- A Discussion about Proofs-Limit Theorems for Sequences-Monotone Sequences and Cauchy Sequences -Subsequences-Lim sup's and Lim inf's-Series-Alternating Series and Integral Tests .

### Unit- II
**Continuity:** Continuous Functions -Properties of Continuous Functions -Uniform Continuity - Limits of Functions

### Unit- III
**Differentiation:** Basic Properties of the Derivative - The Mean Value Theorem - * L'Hospital Rule - Taylor's Theorem.

### Unit- IV
**Integration :** The Riemann Integral - Properties of Riemann Integral-Fundamental Theorem of Calculus.

**Text:**

- Kenneth A Ross,*Elementary Analysis-The Theory of Calculus*

**References:**

- S.C. Malik and Savita Arora, *Mathematical Analysis, Second Edition, Wiley Eastern Limited, New Age International (P) Limited, New Delhi, 1994.*

- William F. Trench, *Introduction to Real Analysis*

- Lee Larson , *Introduction to Real Analysis I*

- Shanti Narayan and Mittal, *Mathematical Analysis*

- Brian S. Thomson, Judith B. Bruckner, Andrew M. Bruckner; *Elementary Real analysis*

- Sudhir R., Ghorpade, Balmohan V., Limaye; *A Course in Calculus and Real Analysis*

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