Course Code	Course Title	C	H	I	E	T
17U5MMC8	Real Analysis	6	6	25	75	100

Learning Objectives

- To provide a strong foundation in basic concepts of Real Analysis which will enrich them to have a good knowledge in Pure Mathematics.
- To impart the knowledge of Metric space, Continuity, Connectedness and Compactness.

Learning Outcomes

On satisfying the requirement of this course, students will

- Have good knowledge of the fundamental mathematical concepts in Real analysis which is very essential for Higher Mathematics.
- Be familiar with Geometric behavior of continuous and discontinuous functions and able to point out the discontinuities on the graph of a function.
- Be able to prove statements and to formulate precise mathematical arguments.
- Demonstrate the ability to solve mathematical problems in Real analysis.

Unit I Metric Spaces

Introduction – Countable sets – Uncountable sets – Inequalities of Holder and Minkowski – Definitions and examples of metric space – Bounded sets in a metric space – Open ball in a metric space – Open sets.

Unit II Metric Spaces (Continued) and Complete Metric Space

Subspaces – Interior of a set – Closed sets – Closure – Limit point – Dense sets – Completeness – Baire's category theorem.

Unit III Continuity

Continuity – Homeomorphism – Uniform continuity – Discontinuous functions on R.

Unit IV Connectedness

Definition and examples – Connected subsets of R – Connectedness and continuity.

Unit V Compactness

Compact space – Compact subsets of R – Compactness and continuity.

Text Book:

S. Arumugam and A. ThangapandiIssac, Modern Analysis,2012, New Gamma Publishing House.

Chapters: 1 (1.1 – 1.14), 2 (2.1 – 2.4, 2.5 – 2.10), 3 (3.1, 3.2), 4 (4.1 – 4.4), 5 (5.1 – 5. 3), 6 (6.1, 6.2, 6.4).

Reference Books:

1. Dr. K. ChandrasekaraRao, Dr. K. Narayanan, Real Analysis, Vol. I &Vol. II, 2008, S. Viswanathan (Printers & Publishers) Pvt. Ltd.
2. M.K. Singal and Asha Rani Singal, A First Course in Real Analysis, 2010 Edition, R. Chand & Co Publication.