

Course Title	Real Analysis	Course No.	MA512
Department	Mathematics	Structure (LTPC)	3-1-0 [4]
Offered for	M.Sc. Students	Type	Compulsory
Pre-requisite	None		

Objectives

1. To train the student in the area of real analysis
2. To give sufficient knowledge of the subject which can be used by student for further applications in their respective domains of interest

Learning Outcomes

1. Metric spaces, compactness, completeness and connectedness
2. Measurability, integrability, Monotone convergence theorem
3. Functions of several variables, inverse function theorem and implicit function theorem

Contents

1. Functions, relations, countable and uncountable sets, axiom of choice, Zorn's lemma,
2. Metric spaces, continuous and uniformly continuous functions, bounded and totally bounded sets, Compactness, Heine-Borel Theorem, Completeness, Cantor's Intersection theorem, Baire spaces, Connectedness, Function spaces, Weierstrass Approximation Theorem.
3. Functions of several variables, continuity, differentiability, partial derivatives, Jacobian, Inverse Function Theorem and Implicit Function Theorem
4. Applications of real analysis

Reference Books

1. Rudin, W. (1976) *Principles of Mathematical Analysis*, 3rd Edition, McGraw-Hill
2. Aliprantis, C. D., and Burkinshaw, O. (1998) *Principles of Real Analysis*, 3rd Edition, Gulf Professional Publishing
3. Royden, H. L. (1998) *Real Analysis*, 3rd Edition, Macmillan Publishing Company
4. Davidson, K. R. and Donsig, A. P. (2010) *Real analysis and applications: Theory in practice*, Springer Verlag

5. *Introduction to Real Analysis* R.G. Bartle.

6. *Introduction to topology & modern Analysis* C.F. Simmons.