

CORE PAPER – VIII - REAL ANALYSIS-I

Semester	Subject Code	Category	Lecture		Theory		Practical	Credits
V	21CM A5B	Core paper – VIII	Hrs/week	Hrs/Sem	Hrs/week	Hrs/Sem	0	4
			6	90	6	90		

COURSE OBJECTIVES:

The students will be able to

- Focus on the proofs of basic theorems in Real analysis.
- Establish the proofs, understand new concepts related to real valued functions.
- Learn the concepts of limits and Continuity

COURSE OUTCOMES:

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Recognize the terminology Functions, Real valued functions, Equivalence, countability and Real numbers, least upper bound.	K2
CO2	Prove standard theorems on Sequences	K2
CO3	Learn the elementary concepts and basic ideas involved in operations on convergent sequence, divergent sequence and Cauchy sequence and also to distinguish conditional and absolute convergent.	K3
CO4	Demonstrate limit of a function on the real line, Metric space and limits in Metric space.	K3
CO5	Explain Continuous functions, functions continuous at a point on a real line, reformulation and continuous on a metric space.	K4

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

MAPPING WITH PROGRAM ME OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	M	M	S	S
CO2	S	S	M	M	M	S
CO3	S	S	M	M	S	S
CO4	S	M	S	S	M	S
CO5	S	S	S	M	M	S

S- Strong M – Medium L – Low

UNIT – I: REAL VALUED FUNCTIONS**18 Hours**

Functions, Real valued functions, Equivalence, countability and Real numbers, least upper bound.

(Chapter: 1.4 to 1.7)

UNIT – II: SEQUENCE**18 Hours**

Sequence – definition – subsequence – limit of a sequence – convergent – divergent sequence, bounded sequence monotone – sequence – series with non-negative terms.

(Chapter: 2.1 to 2.6)

UNIT – III: SEQUENCE(Contd.) AND SERIES**18 Hours**

Operations on convergent sequence – operations on divergent sequence – Cauchy sequence.

Series: Convergence and divergence – Series with non-negative terms – conditional and absolute convergence.

(Chapter: 2.7, 2.8, 2.10 and Chapter: 3.1, 3.2,3.4)

UNIT – IV: LIMITS AND METRIC SPACE**18 Hours**

Limit of a function on the real line – Metric space – Limits in Metric space.

(Chapter: 4.1 to 4.3)

UNIT – V: CONTINUOUS FUNCTIONS**18 Hours**

Functions continuous at a point on a real line – Reformulation – continuous on a metric space - Open sets, closed sets.

(Chapter: 5.1 to 5.5)

DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%

TEXT BOOK

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	R.Goldberg	Methods of Real Analysis	Oxford and IBH Publishing co., New Delhi	1970

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Tom M. Apostol	Mathematical Analysis	Addison-Wesley, New York	1974
2.	Bartie, R.GandShebert	Real Analysis	John Willey &sons Inc., New York	1976
3.	S.C. Malik and SavitaArora,	Mathematical Analysis	Willey Eastern Limited,New Delhi.	1991
4.	Sanjay Arora and Bansilal,	Introduction to Real Analysis,	SatyaPrakashan, New Delhi.	1991

WEB RESOURCES

1. <https://www.scribd.com/document/422568997/Goldberg-Method-of-Real-Analysis>
2. <https://www.goodreads.com/book/show/28381581-methods-of-real-analysis>

TEACHING METHODOLOGY

1. Class room teaching
2. Giving Assignments for all units
3. Discussions
4. Home test
5. PPT presentation

SYLLABUS DESIGNER

Mrs. B. Vijayalakshmi, Assistant Professor of Mathematics.