Faculty of Science and Humanities
B.Sc. (Mathematics) (Semester - 5)
In Effect from Academic Year 2023-24

Branch Name:	B.Sc. Mathematics
Program Code:	SC104
Course Name:	Mathematical Analysis-I
Course Code:	2SC1040502
Pre-requisite Course:	

Course Objectives:

1. To understand the concept of the real field to be developed by ordered set approach.
2. To understand Dedekind's approach.
3. To know about Roots and Ratio Test.
4. To understand the concept of Sequences of functions.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory (Marks)		Practical (Marks)		
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total (Marks)
3	--	--	3	70	30	--	--	100

Subject Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	**Number System:** The real field to be developed by ordered set approach, Equivalence of this approach and Dedekind's approach, Extended real number System, The complex number system, Euclidean spaces.	15	33
2	**Numerical Sequences and Series:** Convergence sequence, Sub sequences, Cauchy Sequences, Upper and lower limits, Special sequences and Series, Series of non negative terms, Roots and Ratio Test. Power Series with Real (Complex) terms, Interval (circle) of convergence and radius of convergence of a power series, Summation by parts, absolute Convergence, addition and multiplication of series.	18	34
3	**Sequences and Series of functions:** Sequences of functions, Limit of a Sequence of functions, Uniform convergence, tests for uniform convergence and continuity, Uniform convergence and differentiation.	15	33

Reference Books:

1. "Principles of Mathematical Analysis" by Walter Rudin, McGraw Hill (International Student Edition), 3rd Edition.
2. "A First Course in Mathematical Analysis" by D. Somasundaram & B. Choudhary, Narosa Publishing House
3. "Fundamentals of Mathematical Analysis" by G. Das & S. Pattnayak Tata Mcgraw Hill Pub. Co
4. "Fundamental of Real Analysis" by S. L. Gupta & Nisha Rani – Vikas Pub. House Pvt. Ltd. New Delhi-1974.
5. "Principle of Real Analysis "by S.C.Malik, Wiley Eastern Limited New Delhi 1982.
6. "Principle of Mathematical Analysis" by T.M. Apostol.

List of Open Source Software/learning website:

1. https://www.youtube.com/watch?v=SUhn5iDpsJ8
2. https://www.youtube.com/watch?v=SvqmrA_vado
3. https://www.youtube.com/watch?v=Nb2XeDAgwqw

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom'sTaxonomyLevel
CLO1	**Describe** the complex number system.	1 Remembering
CLO2	**Discuss** the knowledge on Equivalence of this approach and Dedekind's approach.	2 Understanding
CLO3	**Use** Cauchy Sequences and using it **solve** the example of its.	3 Applying
CLO4	**Explain** Power Series with Real (Complex) term.	4 Analysing, 3 Applying
CLO5	Know the Sequences and Series of functions to **Justify** the Limit of a Sequence of functions.	5 Evaluating
CLO6	**Create** an example of Uniform convergence.	6 creating

Mapping of CLOs with Pos & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1		L	H						M		M		L	M		
CLO2	M	L				L			M				M	L		
CLO3	M	M		L		L			L							M
CLO4	L	L			L					M		L		M	M	
CLO5	L	L			L					M		L		M	M	
CLO6			H		M				L	L		M	L			M

H: High, M: Medium, L: Low