



Indraprastha College for Women University of Delhi

Work Plan for ODD SEMESTER – 2026

Course Name:	B. A. Programme
Paper Title:	Elements of Real Analysis DSC NON MAJOR
Unique Paper Code:	2352203501
Semester:	V
Faculty(s):	Monika Bansal
Year:	2026-27

Work Plan			
Unit No.	Learning Objective	Lecture No.	Topics to be Covered
I	- The real line with algebraic, order - Convergence and divergence of s	1	Field and order properties of a real number, bounded completeness axiom and th
		2	Field and order properties of a real number, bounded
		3	a real number, bounded
		4	completeness axiom and th
		5	Field and order properties of a real number, bounded
		6	a real number, bounded
		7	completeness axiom and th
		8	Field and order properties of a real number, bounded
		9	a real number, bounded
		10	completeness axiom and th
		11	Field and order properties of a real number, bounded
		12	a real number, bounded
		13	completeness axiom and th
		14	Field and order properties of a real number, bounded
		15	a real number, bounded
Unit 2	Convergence and divergence of sequences of real numbers with applications.	16	Convergence of a real sequence
		17	Convergence of a real sequence
		18	Examples : Convergence of a real sequence
		19	Algebra of limits

		20	Behaviour of Convergent Sequences and Results based on these.
		21	The squeeze principle and applications
		22	Monotone sequences
		23	Monotone sequences
		24	Monotone convergence theorem and applications
		25	Monotone convergence theorem and applications
		26	Cauchy sequences
		27	Cauchy sequences
		28	Cauchy sequences
		29	Cauchy criterion for convergence and applications.
		30	Cauchy criterion for convergence and applications.
Unit 3	Learn to apply various tests such as comparison, ratio, root, etc. for convergence and absolute convergence.	31	Convergence and divergence of series
		32	convergence, Cauchy criterion
		33	term series, Applications of tests
		34	Cauchy's n th root test, Ratio test
		35	Absolute and conditional convergence
		36	Convergence and divergence of series
		37	convergence, Cauchy criterion
		38	term series, Applications of tests
		39	Cauchy's n th root test, Ratio test
		40	Absolute and conditional convergence
		41	Convergence and divergence of series
		42	convergence, Cauchy criterion
		43	term series, Applications of tests
		44	Cauchy's n th root test, Ratio test
		45	Absolute and conditional convergence

Unit	TOPICS
I	UNIT-I: Basic Properties of the Set of Real Numbers Field and order properties of $\mathbb{R}$, basic properties and inequalities of the absolute value of a real number, bounded above and bounded below sets, Suprema and infima, The completeness axiom and the Archimedean property of $\mathbb{R}$. (12HRS)

II	UNIT- II: Real Sequences(18 HRS) Convergence of a real sequence, Algebra of limits, The squeeze principle and applications, Monotone sequences, Monotone convergence theorem and applications, Cauchy sequences, Cauchy criterion for convergence and applications.
III	UNIT-III: Infinite Series of Real Numbers (15 hours) Convergence and divergence of infinite series of real numbers, Necessary condition for convergence, Cauchy criterion for convergence of series, Tests for convergence of positive term series, Applications of the integral test, Comparison tests, D'Alembert's ratio test, Cauchy's n th root test, Raabe's test; Alternating series, Leibniz alternating series test, Absolute and conditional convergence.
S. No.	Name of Authors/Books/Publishers
1.	Essential Reading 1. Denlinger, Charles G. (2011). Elements of Real Analysis. Jones & Bartlett India Pvt. Ltd. Student Edition. Reprinted 2015.
2.	Suggestive Readings Bartle, Robert G., & Sherbert, Donald R. (2011). Introduction to Real Analysis (4th ed.). John Wiley & Sons. Wiley India Edition 2015.
3.	Bilodeau, Gerald G., Thie, Paul R., & Keough, G. E. (2010). An Introduction to Analysis (2nd ed.). Jones & Bartlett India Pvt. Ltd. Student Edition. Reprinted 2015.

Paper Components			
Credits	Lecture (L)	Tutorial (T)	Practical (P)
4	3	1	NA
Assessment Scheme			
S.No.	Component	Marking Scheme	Total Marks
1	Internal Assessment	30	30
	• Assignment	12	
	• Class Test	12	
	• Attendance	6	
2.	Continuous Assessment (Tutorial)	40	40
	• Activity 1	35	

	- Activity 2 - Attendance	NA	
		5	
3.	Practical	NA	NA
	Continuous Assessment		
	End Term Written/Practical Exam		
	Viva		
4.	End Semester Examination		90