Indraprastha College for Women
University of Delhi

Course Name:	B. A. Programme
Paper Title:	Elements of Real Analysis
Unique Paper Code:	
Semester:	V
Faculty(s):	Dr. Manju Sharma
Year:	August 2024- Dec 2024

Work Plan

Period	Unit No.	Learning Objective	Topics to be Covered
1st Aug -3rd Aug	I	The real line with algebraic, order and completeness properties.	Basic Properties of the Set of Real Numbers: Field and order properties of R.
5th Aug-10th Aug	I	The real line with algebraic, order and completeness properties.	Inequalities of the absolute value of a real number.
12th Aug-17th Aug	I	The real line with algebraic, order and completeness properties.	Basic properties and inequalities of the absolute value of a real number.
19th Aug-24th Aug	I	The real line with algebraic, order and completeness properties.	Bounded above and bounded below sets.
26th Aug-31st Aug	I	The real line with algebraic, order and completeness properties.	Suprema and infima.

2nd Sep-7th Sep	I	The real line with algebraic, order and completeness properties.	The completeness axiom and the Archimedean property of R.

9th Sep-14th Sep	II	Convergence and divergence of sequences of real numbers with applications.	Cauchy sequences
16th Sep-21st Sep	II	Convergence and divergence of sequences of real numbers with applications.	Cauchy criterion for convergence and applications
23rd Sep-28th Sep	II	Convergence and divergence of sequences of real numbers with applications.	Cauchy criterion for convergence and applications
30th Sep-5th Oct	III	Convergence and divergence of series of real numbers with applications.	Convergence and divergence of infinite series of real numbers, Necessary condition for Convergence.
7th Oct-12th Oct	III	Convergence and divergence of series of real numbers with applications.	Cauchy criterion for convergence of series
14th Oct-19th Oct	III	Convergence and divergence of series of real numbers with applications.	Tests for convergence of positive term series, Applications of the integral test.
21st Oct-26th Oct	III	Convergence and divergence of series of real numbers with applications.	Comparison tests, D'Alembert's ratio test.
28th Oct-2nd Nov			MID SEMESTER BREAK
4th Nov-9th Nov	III	Convergence and divergence of series of real numbers with applications.	Cauchy's nth root test, Raabe's test.
11th Nov-16th Nov	III	Convergence and divergence of series of real numbers with applications.	Alternating series, Leibniz alternating series test.

18th Nov-23rd Nov	III	Convergence and divergence of series of real numbers with applications.	Absolute and conditional convergence
25th Nov-27th Nov	III	Convergence and divergence of series of real numbers with applications.	Revision
28th Nov	DISPERSAL OF CLASSES		

Unit	TOPICS
I	Basic Properties of the Set of Real Numbers (12 hours) Field and order properties of 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 R.
II	Cauchy sequences, Cauchy criterion for convergence and applications.
III	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 nth 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.