



Indraprastha College for Women

University of Delhi

Course Name:	B.Sc. (Hons.) Mathematics
Paper Title:	Sequences and Series of Functions
Unique Paper Code:	
Semester:	IV
Faculty(s):	Mrs. Sarita Anand
Year:	2023-2024

Work Plan

Unit No.	Learning Objective	Lecture No.	Topics to be Covered
I	Sequences of Functions	1	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	2	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	3	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	4	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	5	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	6	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	7	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	8	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	9	Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence.
I	Sequences of Functions	10	Continuity of the limit function of a sequence of functions, Interchange of

			the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
I	Sequences of Functions	11	Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
I	Sequences of Functions	12	Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
I	Sequences of Functions	13	Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
I	Sequences of Functions	14	Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
I	Sequences of Functions	15	Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
I	Sequences of Functions	16	Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
I	Sequences of Functions	17	Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
I	Sequences of Functions	18	Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.
II	Series of Functions	19	Pointwise and uniform convergence of series of functions, Theorems on the continuity, and integrability of the sum function of a series of functions.
II	Series of Functions	20	Pointwise and uniform convergence of series of functions, Theorems on the continuity, and integrability of the sum function of a series of functions.
II	Series of Functions	21	Pointwise and uniform convergence of series of functions, Theorems on the

			continuity, and integrability of the sum function of a series of functions.
II	Series of Functions	22	Pointwise and uniform convergence of series of functions, Theorems on the continuity, and integrability of the sum function of a series of functions.
II	Series of Functions	23	Pointwise and uniform convergence of series of functions, Theorems on the continuity, and integrability of the sum function of a series of functions.
II	Series of Functions	24	Pointwise and uniform convergence of series of functions, Theorems on the continuity, and integrability of the sum function of a series of functions.
II	Series of Functions	25	Theorem on the differentiability of the sum function of a series of functions, Cauchy criterion, and the Weierstrass M-test for uniform convergence.
II	Series of Functions	26	Theorem on the differentiability of the sum function of a series of functions, Cauchy criterion, and the Weierstrass M-test for uniform convergence.
II	Series of Functions	27	Theorem on the differentiability of the sum function of a series of functions, Cauchy criterion, and the Weierstrass M-test for uniform convergence.
II	Series of Functions	28	Theorem on the differentiability of the sum function of a series of functions, Cauchy criterion, and the Weierstrass M-test for uniform convergence.
II	Series of Functions	29	Theorem on the differentiability of the sum function of a series of functions, Cauchy criterion, and the Weierstrass M-test for uniform convergence.
II	Series of Functions	30	Theorem on the differentiability of the sum function of a series of functions, Cauchy criterion, and the Weierstrass M-test for uniform convergence.

Syllabus		
Unit	Contents	Contact Hours
I	UNIT – I: Sequences of Functions Pointwise and uniform convergence of sequence of functions, The uniform norm, Cauchy criterion for uniform convergence, Continuity of the limit function of a sequence of functions, Interchange of the limit and derivative, and the interchange of the limit and integral of a sequence of functions, Bounded convergence theorem.	18
II	UNIT – II: Series of Functions Pointwise and uniform convergence of series of functions, Theorems on the continuity, differentiability and integrability of the sum function of a series of functions, Cauchy criterion and the Weierstrass M-test for uniform convergence.	12

III	UNIT – III: Power Series Definition of a power series, Radius of convergence, Absolute convergence (Cauchy Hadamard theorem), Differentiation and integration of power series, Abel's theorem, Weierstrass's approximation theorem; The exponential, logarithmic and trigonometric functions: Definitions and their basic properties.	15
	Total	45
Text Books/Suggested Readings:		
S. No.	Name of Authors/Books/Publishers	Year of Publication/ Repr int
1.	Bartle, Robert G., & Sherbert, Donald R. (2011). Introduction to Real Analysis (4th ed.). Wiley India Edition. Indian Reprint.	2011
2.	Ross, Kenneth A. (2013). Elementary Analysis: The Theory of Calculus (2nd ed.). Undergraduate Texts in Mathematics, Springer. Indian Reprint.	2013

Paper Components			
Credits	Lecture (L)	Tutorial (T)	Practical (P)
4	3	1	0
Assessment Scheme			
S.No.	Component	Marking Scheme	Total Marks
1	Internal Assessment	30	
	<ul style="list-style-type: none"> ● Assignment/Quiz/Project/Presentation 	12	
	<ul style="list-style-type: none"> ● Class Test 	12	
	<ul style="list-style-type: none"> ● Attendance 	6	
2.	Continuous Assessment (Tutorial)	40	
	<ul style="list-style-type: none"> ● Activity 1 	20	
	<ul style="list-style-type: none"> ● Activity 2 	15	
	<ul style="list-style-type: none"> ● Attendance 	5	
3.	Practical	NA	
	<ul style="list-style-type: none"> ● Continuous Assessment 		
	<ul style="list-style-type: none"> ● End Term Written/Practical Exam 		
	<ul style="list-style-type: none"> ● Viva 		
4.	End Semester Examination		90

