



ARSD College, University of Delhi

Model Course Handout/Lesson Plan

Course Name : B.Sc. (H) Mathematics						
Semester	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
4th		Riemann Integration & Series of Functions	5	1		6
Teacher/Instructor(s)		Amit Kumar				
Session		2021-22				

Course Objective: To understand the integration of bounded functions on a closed and bounded interval and its extension to the cases where either the interval of integration is infinite, or the integrand has infinite limits at a finite number of points on the interval of integration. The sequence and series of real valued functions, and an important class of series of functions (i.e., power series).

Course Learning Outcomes: The course will enable the students to:

- i) Learn about some of the classes and properties of Riemann integrable functions, and the applications of the Fundamental theorems of integration.
- ii) Know about improper integrals including, beta and gamma functions.
- iii) Learn about Cauchy criterion for uniform convergence and Weierstrass M-test for uniform convergence.
- iv) Know about the constraints for the inter-changeability of differentiability and integrability with infinite sum.
- v) Approximate transcendental functions in terms of power series as well as, differentiation and integration of power series.

Lesson Plan:

Unit No.	Learning Objective	Lecture No.	Topics to be covered
1.	Power Series	1-3	Definition of a power series, Radius of convergence.
		4-5	Absolute (Cauchy–Hadamard theorem) and uniform convergence of a power series.
		6-8	Differentiation and integration of power series
		9-10	Statement of Abel's theorem and its illustration with the help of examples.

Evaluation Scheme:

No.	Component	Duration	Marks
1.	Internal Assessment		25
	• Quiz		
	• Class Test		
	• Attendance		
	• Assignment		
2.	End Semester Examination	3 hr	75

Details of the Course			
Unit	Contents		Contact Hours
4	Definition of a power series, Radius of convergence, Absolute convergence (Cauchy–Hadamard theorem), Uniform convergence, Differentiation and integration of power series, Abel's theorem.		10
	*Unit 1,2 and 3 by another teacher		10
Suggested Books:			
Sl. No.	Name of Authors/Books/Publishers		Year of Publication/Reprint
1	Ross, Kenneth A. (2013). Elementary Analysis: The Theory of Calculus (2nd ed.). Undergraduate Texts in Mathematics, Springer.		2013
Mode of Evaluation:		Internal Assessment / End Semester Exam	