Lecture Plan

Name of the College: Government College of Arts, Science and Commerce, Sanquelim-Goa

Name of Faculty: Amit Harichandra Thakur	**Subject:** Mathematics	
Paper code: MTC 106	**Program: B**.Sc.	**Division: -**
Academic year: 2024-25	**Semester:** V	**Total Lectures: 45**

Course Objectives:

This course helps in understanding advanced concepts of applied analysis.

Expected Course Outcome:

On completion of this course the learner will be able to :

1) Explain improper integrals & use different tests with analytic & comparison techniques to find the values and solve convergence problems.
2) Determine the radius & interval of convergence of power series, effect of term by term differentiation & integration of power series, addition & multiplication of power series and prove theorems on power series.
3) Describe periodic functions & their expression as Fourier series & discuss related properties.
4) Learn about Inner product spaces with properties

Student Learning Outcome:

Students will learn to evaluate improper integrals, compute beta , gamma functions and Fourier series.

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise / Assignment	ICT Tools	Reference books
July	01/07/2024	06/07/2024	3	Improper Integrals of type I;Cauchy's general principle of convergence for Improper integrals of type I; Comparison test for improper integrals of type I; Comparison test in limit form for improper integrals of type I;		Chalk Board	Mathematical analysis II R.D. Bhat
	08/07/2024	13/07/2024	3	p - test for improper integrals of type I; Problems on Improper Integrals of type I;		Chalk Board	Mathematical analysis II R.D. Bhat
	15/07/2024	20/07/2024	3	Improper Integrals of type II; Cauchy's general principle of convergence for Improper integrals of type II; Comparison test for improper integrals of type II; Comparison test on limit form for improper integrals of type II;		Chalk Board	Mathematical analysis II R.D. Bhat
	22/07/2024	27/07/2024	3	p - test for improper integrals of type II;		Chalk Board	Mathematical analysis II R.D. Bhat

				Problems on Improper Integrals of type II;			
July August	29/07/2024	03/08/2024	3	Problems on Improper Integrals of type III		Chalk Board	Mathematical analysis II R.D. Bhat
August	05/08/2024	10/08/2024	3	Problems on Improper Integrals of type III		Chalk Board	Mathematical analysis II R.D. Bhat
	12/08/2024	17/08/2024	3	Beta and gamma function Definition of beta function Functions and their convergence		Chalk Board	Mathematical analysis II R.D. Bhat
	19/08/2024	24/08/2024	3	Properties of Beta functions.		Chalk Board	Mathematical analysis II R.D. Bhat
	26/08/2024	31/08/2024	3	Gamma function and it's properties		Chalk Board	Mathematical analysis II R.D. Bhat
September	02/09/2024	07/09/2024	2	Relation between beta and Gamma functions. Legendre's duplication formula		Chalk Board	Mathematical analysis II R.D. Bhat

	09/09/2024	14/09/2024	3	Power series Definition and examples. Radius and interval of convergence,		Chalk Board	Mathematical analysis II R.D. Bhat
	16/09/2024	21/09/2024	3	Uniform convergence and absolute convergence, Term by term differentiation and integration of power series in IR.		Chalk Board	Mathematical analysis II R.D. Bhat
	23/09/2024	28/09/2024	3	Power series definitionsof Exponential, functions and it's properties.		Chalk Board	Mathematical analysis II R.D. Bhat
September October	30/09/2024	05/10/2024	3	Power series definitionsof logarithmic, functions and it's properties		Chalk Board	Mathematical analysis II R.D. Bhat
	07/10/2024	12/10/2024	3	Power series definitions of trigonometric functions and it's properties		Chalk Board	Mathematical analysis II R.D. Bhat
October	14/10/2024	19/10/2024	3	Weierstrass' polynomial approximation theorem. Revision		Chalk Board	Mathematical analysis II R.D. Bhat
	21/10/2024	23/10/2024	3	Revision		Chalk Board	Mathematical analysis II R.D. Bhat

*** Assessment Rubrics**

Component	Max Marks
ISA 1	15
ISA 2	15
Semester End Exam	120