Lecture Plan

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

Name of Faculty: Mr. Deepak G Bandiwadikar	**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	Introduction to inner products Square integrable functions.	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	08/07/2024	13/07/2024	3	Usual integral inner product on C[a, b] and its properties	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	15/07/2024	20/07/2024	3	Norm induced by usual integral inner product	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	22/07/2024	27/07/2024	3	Orthogonal and orthonormal sequences of functions in C[a, b] with usual integral inner product.	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
July August	29/07/2024	03/08/2024	3	Complete orthogonal and orthonormal set in C[a, b] with respect to usual integral inner product.	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
August	05/08/2024	10/08/2024	3	Bessel's inequality and Parsevel's identity set in C[a, b] with respect to usual integral inner product	Problem solving	Chalk Board	Mathematical analysis II

							R.D. Bhat
	12/08/2024	17/08/2024	3	Fourier series of real functions on $(-\pi , \pi)$ and $(0, \pi)$.	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	19/08/2024	24/08/2024	3	Fourier series of real functions on $(-\pi , \pi)$ and $(0, \pi)$.	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	26/08/2024	31/08/2024	3	Fourier coefficients; properties of Fourier coefficients;	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
September	02/09/2024	07/09/2024	2	Fourier series of a function relative to an orthonormal system	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	09/09/2024	14/09/2024	3	Bessel's inequality. Trigonometric Fourier series, Fourier series of odd & even function	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	16/09/2024	21/09/2024	3	Integration & differentiation of Fourier series at a point. Fourier theorem	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	23/09/2024	28/09/2024	3	Integration & differentiation of Fourier series at a point. Fourier theorem	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat

September October	30/09/2024	05/10/2024	3	Fourier Series of real functions on (c, c+2l).	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
October	07/10/2024	12/10/2024	3	Fourier Series of real functions on (c, c+2l).	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	14/10/2024	19/10/2024	3	Revision	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat
	21/10/2024	23/10/2024	3	Revision	Problem solving	Chalk Board	Mathematical analysis II R.D. Bhat

*** Assessment Rubrics**

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