

Lecture Plan		
Name of the College: Government College of Arts, Science and Commerce, Sanquelim-Goa		
Name of Faculty: Prajyot Maruti Patil	Subject: Mathematics	
Paper code: MAT-201, Ordinary Differential Equations	Program: B.Sc.	Division: -
Academic year: 2025-26	Semester: III	Total Lectures: 60
Course Objectives:		
1. This course helps in understanding basic concepts of Differential Equations. It develops the ability to solve differential equations by analytical and numerical methods		
Expected Course Outcome:		
1) Identify the type of a given differential equation.		
2) Understand the concept and apply appropriate analytical techniques for finding the solution.		
3) Prove various results concerning the methods and existence and uniqueness of solutions of differential equations.		
4) Solve ordinary differential equations by using various numerical methods.		
Student Learning Outcome: Student will be able to		
1) Identify the type of a given differential equation and apply appropriate analytical techniques for finding the solution.		
2) Solve ordinary differential equations by using various numerical methods.		

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
June	20/06/2025	21/06/2025	1	Discussion of prerequisites			
	23/06/2025	28/06/2025	4	Some Basic Mathematical Models		Smart Board PDF	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
July	30/06/2025	05/07/2025	4	Direction Fields; Solutions of Some Differential Equations; Classification of Differential Equations		Smart Board PDF	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	07/07/2025	12/07/2025	4	Linear Equations; Bernoulli Equation Method of Separation of Variables			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	14/07/2025	19/07/2025	4	First Order Equations; Linear and Nonlinear Equations;		Data projector	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	21/07/2025	26/07/2025	4	Exact Equations and Integrating			Boyce, W. E. and

				Factors; Initial Value Problems; The Existence and Uniqueness Theorem for initial value problem. (Proof to be done)			DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
July August	28/07/2025	02/08/2025	4	Homogeneous Equations with Constant Coefficients; Solutions of Linear Homogeneous Equations:			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
August	04/08/2025	09/08/2025	4	The Wronskian; Complex Roots of the Characteristic Equation; Euler-Cauchy Equations,		Smart Board	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	11/08/2025	16/08/2025	3 IndependenceDay	Repeated Roots; Reduction of Order; Nonhomogeneous Equations; Method of Undetermined Coefficients; Variation of Parameters.			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	18/08/2025	23/08/2025	4	General Theory of nth Order Linear Equations with Constant Coefficients; Homogeneous and NonHomogeneous Equations;		Smart Board PDF	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems

	25/08/2025	30/08/2025	0 Chaturthi Break 26/08/25 To 01/09/25				Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
September	02/09/2025	06/09/2025	3	The Method of Undetermined Coefficients, The Method of Variation of Parameters		Smart Board	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	08/09/2025	13/09/2025	4	Inverse D – operators			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	15/09/2025	20/09/2025	4	Solution of $f(D)y = X$ where $X = \exp(kx)$, $\cos(kx)$		Smart Board	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	22/09/2025	27/09/2025	4	Solution of $f(D)y = X$ where $X = \exp(kx)$, $\cos(kx)$, $\sin(kx)$, polynomials in x and their products		Smart Board	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems

September October	29/09/2025	04/10/2025	3 Gandhi Jayanti / Dussehra	$\{1/(D^2 + a^2)\}f(x)$, where $f(x) = \sin(ax)$, $\cos(ax)$			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
October	06/10/2025	11/10/2025	4	Euler's and Modified Euler's method; Taylor's Method;			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	13/10/2025	18/10/2025	4	Runge – Kutta second and fourth order methods. (Formulae and examples only)			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems

*** Assessment Rubrics**

Component	Max Marks
ISA 1	10
ISA 2	10
Practical	Nil
Project	Nil
Semester End Exam	80

