

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: 2026-27	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	22/06/2026	27/06/2026	4	Discussion of prerequisites			
	29/06/2026	04/07/2026	4	Some Basic Mathematical Models		Smart Board PDF	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
July	06/07/2026	11/07/2026	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
	13/07/2026	18/07/2026	4	Linear Equations; Bernoulli Equation Method of Separation of Variables			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	20/07/2026	25/07/2026	4	First Order Equations; Linear and Nonlinear Equations;		Data projector	Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
July/August	27/07/2026	01/08/2026	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
August	03/08/2026	08/08/2026	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
	10/08/2026	15/08/2026	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
	17/08/2026	22/08/2026	4	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
	24/08/2026	29/08/2026	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

October	05/10/2026	10/10/2026	4	$\{1/(D^2 + a^2)\}f(x)$, where $f(x) = \sin(ax)$, $\cos(ax)$			Boyce, W. E. and DiPrima, R. C.: Elementary Differential Equations and Boundary Value Problems
	12/10/2026	14/10/2026	2	Euler's and Modified Euler's method; Taylor's Method; 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