



# Indraprastha College for Women

## University of Delhi

Course Name:	B.A.(Prog.)
Paper Title:	Differential Equations
Unique Paper Code:	2352572301
Semester:	III
Faculty(s):	Dr. Manju Sharma
Year:	2024

<b>Work Plan</b>			
Period	Unit No.	Learning Objective	Topics to be Covered
1 <sup>st</sup> Aug -3 <sup>rd</sup> Aug	I	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	First order ordinary differential equations: Basic concepts and ideas.
5 <sup>th</sup> Aug-10 <sup>th</sup> Aug	I	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Integrating factors and rules to find integrating factors
12 <sup>th</sup> Aug-17 <sup>th</sup> Aug	I	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	First order ordinary differential equations:
19 <sup>th</sup> Aug-24 <sup>th</sup> Aug	I	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> </ul>	Linear equations and Bernoulli equations

		<ul style="list-style-type: none"> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	
26 <sup>th</sup> Aug-31 <sup>st</sup> Aug	I	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Initial Value Problems. Applications of first order differential equations
2 <sup>nd</sup> Sep-7 <sup>th</sup> Sep	I	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Orthogonal trajectories and Rate Problems
9 <sup>th</sup> Sep-14 <sup>th</sup> Sep	I	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Basic theory of higher order linear differential equations
16 <sup>th</sup> Sep-21 <sup>st</sup> Sep	III	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Classification and Construction of first-order partial differential equations.
23 <sup>rd</sup> Sep-28 <sup>th</sup> Sep	III	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Method of characteristics. general solutions of first-order partial differential equations

30 <sup>th</sup> Sep-5 <sup>th</sup> Oct	III	<ul style="list-style-type: none"> <li>• Ordinary and partial differential equations.</li> <li>• Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>• Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Examples based on Method of characteristics. general solutions of first-order partial differential equations
7 <sup>th</sup> Oct-12 <sup>th</sup> Oct	III	<ul style="list-style-type: none"> <li>• Ordinary and partial differential equations.</li> <li>• Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>• Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Canonical forms
14 <sup>th</sup> Oct-19 <sup>th</sup> Oct	III	<ul style="list-style-type: none"> <li>• Ordinary and partial differential equations.</li> <li>• Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>• Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Method of separation of variables for first order partial differential equations
21 <sup>st</sup> Oct-26 <sup>th</sup> Oct	III	<ul style="list-style-type: none"> <li>• Ordinary and partial differential equations.</li> <li>• Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>• Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Classification of second-order linear partial differential equations and their general solutions.
28 <sup>th</sup> Oct-2 <sup>nd</sup> Nov			MID SEMESTER BREAK
4 <sup>th</sup> Nov-9 <sup>th</sup> Nov	III	<ul style="list-style-type: none"> <li>• Ordinary and partial differential equations.</li> <li>• Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>• Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Classification and reduction to canonical forms of second-order linear partial differential equations and their general solutions.
11 <sup>th</sup> Nov-16 <sup>th</sup> Nov	III	<ul style="list-style-type: none"> <li>• Ordinary and partial differential equations.</li> <li>• Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>• Various techniques to find the solutions of above differential equations which provide a basis</li> </ul>	Classification and reduction to canonical forms of second-order linear partial differential equations and their general solutions.

		to model complex real-world situations.	
18 <sup>th</sup> Nov-23 <sup>rd</sup> Nov	III	<ul style="list-style-type: none"> <li>● Ordinary and partial differential equations.</li> <li>● Basic theory of higher order linear differential equations, Wronskian and its properties.</li> <li>● Various techniques to find the solutions of above differential equations which provide a basis to model complex real-world situations.</li> </ul>	Problems
25 <sup>th</sup> Nov-27 <sup>th</sup> Nov			Revision
28 <sup>th</sup> Nov	DISPERSAL OF CLASSES		

Unit	TOPICS
I	<p><b>Ordinary Differential Equations</b></p> <p>First order ordinary differential equations: Basic concepts and ideas, First order Exact differential equations, Integrating factors and rules to find integrating factors, Linear equations and Bernoulli equations, Initial value problems, Applications of first order differential equations: Orthogonal trajectories and Rate problems; Basic theory of higher order linear differential equations, Wronskian and its properties.</p>
II	
III	<p><b>First and Second Order Partial Differential Equations</b></p> <p>Classification and Construction of first-order partial differential equations, Method of characteristics and general solutions of first-order partial differential equations, Canonical forms and method of separation of variables for first order partial differential equations; Classification and reduction to canonical forms of second-order linear partial differential equations and their general solutions.</p>
S. No.	Name of Authors/Books/Publishers
1.	Myint-U, Tyn and Debnath, Lokenath (2007). Linear Partial Differential Equations for Scientist and Engineers (4th ed.). Birkhäuser. Indian Reprint.
2.	Ross, Shepley L. (1984). Differential Equations (3rd ed.). John Wiley & Sons.