	DPG Institute of Technology and Management **Sector 34, Gurugram HR 122004**
	Lesson Plan
	Course Name: Mathematics III
	Faculty Name: Mr. Avikshit Sharma

No. of Lecture Hours/Week	**3**		**Exam Hours**	**3**
Total No. of Lecture Hours	**35**		**Exam Marks**	**75**
Course Code:	**BSC-MATH-203G**			

Course Objectives:

1. To develop the understanding of functions of several variables, limits, continuity, and partial derivatives, and Euler's theorem and Lagrange's multipliers for solving problems.
2. To evaluate double and triple integrals, perform change of order and variables, and apply these concepts in computing areas and volumes bounded by curves and surfaces.
3. To introduce methods of solving first-order and first-degree differential equations, and to apply electric circuits, cooling, heat flow, and orthogonal trajectories.
4. To provide an understanding of linear differential equations of higher order, their complementary and particular solutions, and their applications in modeling oscillatory systems.

S.No	Topics to be covered	Teaching Methodology	Activity	Remarks
SECTION A **Multivariable Differential Calculus**				
1	Limit	Chalk &Talk		
2	Homogeneous functions	Chalk &Talk		
3	Saddle points	Chalk &Talk		
4	Lagrange's method of undetermined multipliers	Chalk &Talk		
5	Total derivative	Chalk &Talk		

6	Continuity	Chalk &Talk		
7	**Questions Practice on limit**	Chalk &Talk		
8	**Exercise on Total Derivative**	Chalk &Talk		
9	Daily life application of continuity	Chalk &Talk		
SECTION B				
10	Double integral	Chalk &Talk		
11	Change of order of integration	Chalk &Talk		
12	Change of variables	Chalk &Talk		
13	Applications of double integral to find area enclosed by plane curves	Chalk &Talk		
14	Triple integral	Chalk &Talk		
15	Exercise on double Integral	Chalk &Talk		
16	Double integral	https://youtu.be/mIeeVrv447s		
SECTION C				
17	Exact differential equations	https://youtu.be/FU-7xJLpoWg		
18	Equations reducible to exact differential equations	NPTEL		
19	Applications of differential equations of first order and first degree to simple electric circuits	NPTEL		
20	Newton's law of cooling	NPTEL		
21	Heat flow	PPT		
22	Orthogonal trajectories	PPT		
23	Exact differential equations	https://youtu.be/FU-7xJLpoWg		
SECTION D				

24	Linear differential equations of second order.	https://youtu.be/NBcGLLU90fM		
25	Linear differential equations of higher order	https://youtu.be/KCjG3_cE51k		
26	Complete solution	PPT		
27	Exercise			
28	Application on linear differential equations of higher order			
29	Exercise			
30	Class test and previous year questions	Chalk &Talk		

SUGGESTED READINGS:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, Pearson Education.
2. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
3. B. V. Ramana, Higher Engineering Mathematics, Tata McGraw-Hill Publishing Company Limited.
4. N. P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
5. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
6. W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary Value Problems,Wiley India.
7. S. L. Ross, Differential Equations, Wiley India.
8. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India.
9. E. L. Ince, Ordinary Differential Equations, Dover Publications

Course Outcomes:

At the end of the course, the student will be able:

CO 1	To deal with functions of several variables and evaluate partial derivative.
CO 2	The mathematical tools needed in evaluating multiple integrals and their usage.
CO 3	The effective mathematical tools for the solutions of ordinary differential equations of first order and its applications.
CO 4	To understand the ordinary differential equations of higher order and its

	Various applications.

CO-PO-PSO Mapping:

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO12	PSO 1	PSO 2	PSO 3
CO1															
CO2															
CO3															
CO4															

Signature of Staff In-charge

Signature of HOD