	DPG Institute of Technology and Management **Sector 34, Gurugram HR 122004**
	Lesson Plan
	Course Name: Mathematics-III
	Faculty Name: Dr. Ritu Bhatia

No. of Lecture Hours/Week	**3(2L+1T)**	**Exam Hours**	**3**
Total No. of Lecture Hours	**38**	**Exam Marks**	**75**
Course Code: BSC-MATH-205-G			

Course Objectives:

At the end of this course, the student should be able to learn the behaviour of civil engineering determinate structures under static and moving loads by analytical/experimental techniques and software tools. The student should also be able to acquire the ability to interpret and evaluate experimental results.

Lecture No	Topics to be covered	Teaching Methodology / Pedagogy	Activity	Remarks
SECTION A(Unit-1) (CO-1)				
1	First order linear partial differential equations.	Chalk &Talk https://youtu.be/2ShrqtDLf0w?si=zBvZIc2qQuSjuPvM		
2	Solution of linear partial differential equation	Chalk &Talk		
3	First order non-linear partial differential equations, Charpit method.	Chalk &Talk	Assignment	
4	Second order linear partial differential equations.	Chalk &Talk		
5	Classifications of Second order linear partial differential equations.	Chalk &Talk		
6	Method of separation of variables.	Chalk &Talk		
7	Method of separation of variables and its applications to wave equation	Chalk &Talk		
8	One dimensional heat equations and two dimensional heat wave	Chalk &Talk		
SECTION B(Unit-2) (CO-2)				
9	Solution of Polynomial and Transcendental equations			
10	Bisection method and numericals on it	Chalk &Talk		
11	Regula-Falsi method.	Chalk &Talk		
12	Newton-Raphson method.	Chalk &Talk		
13	Newton's forward and backward difference formulae	Chalk &Talk		
14	Newton's divided difference formula	Chalk &Talk		
15	Lagrange's formulae	Chalk &Talk	Quiz/MCQ	
16	Numerical Integration , Trapezoidal rule, Simpson's 1/3rd and 3/8 rules	Chalk &Talk https://youtu.be/YTHt4Sp8Hag?si=8PDeL1SGRthGdwu-		

17	Class Test	Chalk &Talk		
SECTION (Unit-3) (CO-3)				
18	Introduction to Laplace Transformation	Chalk &Talk		
19	Numericals on Laplace Transform	Chalk &Talk		
20	Properties of Laplace transform.	Chalk &Talk https://youtu.be/-3GHoQ4jDAk?si=BgH2PsZvmWEMLQwW		
21	Laplace transform of periodic functions,	Chalk &Talk		
22	Inverse Laplace transform by different methods,	Chalk &Talk		
23	Convolution theorem for finding inverse Laplace transformation.	Chalk &Talk	Group Discussion	
24	Evaluation of integrals by Laplace transform.	Chalk &Talk		
25	Solving ordinary differential equations by Laplace transform method	Chalk &Talk		
26	Doubt Session	Chalk &Talk		
SECTION D(Unit-4) (CO-4)				
27	Permutation and Combination	Chalk &Talk		
28	Pigeon-hole principle and extended pigeon hole principle	Chalk &Talk		
29	Algebraic structures with one binary operation	Chalk &Talk		
30	Semi group and Monoid	Chalk &Talk		
31	Group and Abelian group	Chalk &Talk		
32	Cosets and Normal group	Chalk & Talk		
33	Lagrange's theorem for finite group	Chalk &Talk https://youtu.be/4x0AryWTwpE?si=1P97bJrHG0wTdFZ4	Students' presentation	
34	Cyclic group and its properties			
35	Doubt Session			
36	Class Test			
Content Beyond Syllabus				
37	Partial Differential Equations	PPT		
38	Laplace Transformation	PPT		

Reference books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons
2. B. V. Ramana, Higher Engineering Mathematics, Tata McGraw-Hill Publishing Company Limited
3. B. S. Grewal, Higher Engineering Mathematics, Khanna Publishers
4. P. Kandasamy, K.Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand and Company
5. S. S. Sastry, Introductory Methods of Numerical Analysis, PHI.
6. N. P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
7. C. L. Liu, Elements of Discrete Mathematics, Tata McGraw-Hill.
8. K. H. Rosen, Discrete Mathematics and its Applications, Tata McGraw-Hill.
9. J. L. Hein, Discrete Structures, Logic and Computability, Jones and Bartle

Course Outcomes:

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

CO1	To solve field problems in engineering involving partial differential equations
CO2	To find roots of polynomial and transcendental equations using numerical methods and conduct numerical integration
CO3	To deal with the Laplace transform and its application
CO4	To classify algebraic structure of any mathematical problem.

CO-PO-PSO Mapping:

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO 11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	1		1	1				1	2	3	2	1	2
CO2	2	1	3	2	2		1		2	2	2	3	2	2	2
CO3	2	1	3	2	2		1		2	2	2	3	2	2	2
CO4	2	1	3	2	2		1		2	2	2	3	2	2	2

Signature of Staff In-charge

Dr. Ritu Bhatia

Signature of HOD

Dr. Simpi Mehta