

**AMBALA COLLEGE OF ENGINEERING AND APPLIED RESERACH**  
**DEPTT. OF ELECTRONICS & Comm. ENGINEERING**  
**LECTURE PLAN- (BS-207A)**

**Name of the Faculty : Dr. Pardeep Singh**  
**Discipline : Applied Sciences & Humanities**  
**Semester : 4th (Elect. & Comm. Engg.)**  
**Subject : Applied and Computational Mathematics (BS-207A)**  
**Lesson Plan Duration : 15 Weeks (from April, 2021 to July 2021)**

**Work Load: Lecture: 03, Tutorials: 00 per week**

Week	Theory	
	Lecture Day	Topic(including assignment /test)
1 <sup>st</sup>	1 <sup>st</sup>	First order ordinary differential equations
	2 <sup>nd</sup>	Exact, linear differential equations
	3 <sup>rd</sup>	Bernoulli's equations
2 <sup>nd</sup>	4 <sup>th</sup>	Euler's equations
	5 <sup>th</sup>	Equations not of first degree: equations solvable for p
	6 <sup>th</sup>	Equations solvable for y, equations solvable for x and Clairaut's type.
3 <sup>rd</sup>	7 <sup>th</sup>	Second order linear differential equations with constant coefficients
	8 <sup>th</sup>	Formation of Partial Differential Equations, Solutions of first order linear and non-linear PDEs
	9 <sup>th</sup>	Charpit's method
4 <sup>th</sup>	10 <sup>th</sup>	Solution to homogenous linear partial differential equations (with constant coefficients) by complimentary function and particular integral method
	11 <sup>th</sup>	Solution to homogenous linear partial differential equations (with constant coefficients) by complimentary function and particular integral method
	12 <sup>th</sup>	Test
5 <sup>th</sup>	13 <sup>th</sup>	Multiple Integration: Double integrals
	14 <sup>th</sup>	Change of order of integration in double integrals
	15 <sup>th</sup>	Change of variables (Cartesian to polar Cordinates)
6 <sup>th</sup>	16 <sup>th</sup>	Triple integrals
	17 <sup>th</sup>	Orthogonal curvilinear coordinates
	18 <sup>th</sup>	Simple applications involving cubes, sphere
7 <sup>th</sup>	19 <sup>th</sup>	Vector Calculus: Gradient, divergence
	20 <sup>th</sup>	Curl and their properties
	21 <sup>st</sup>	Directional derivative. Line integrals
8 <sup>th</sup>	22 <sup>nd</sup>	Surface integrals, volume integrals
	23 <sup>rd</sup>	Theorems of Green, Gauss and Stokes (without proof)

	24 <sup>th</sup>	Test
9 <sup>th</sup>	25 <sup>th</sup>	Laplace Transform
	26 <sup>th</sup>	Laplace Transform of Elementary Functions
	27 <sup>th</sup>	Basic properties of Laplace Transform
10 <sup>th</sup>	28 <sup>th</sup>	Laplace transform of periodic functions
	29 <sup>th</sup>	Finding inverse Laplace transform by different methods
	30 <sup>th</sup>	Convolution theorem,
11 <sup>th</sup>	31 <sup>st</sup>	Solving ODEs by Laplace Transform method
	32 <sup>nd</sup>	Test
	33 <sup>rd</sup>	Solution of polynomial and transcendental equations: Bisection method
12 <sup>th</sup>	34 <sup>th</sup>	Newton-Raphson method
	35 <sup>th</sup>	Regula-Falsi method
	36 <sup>th</sup>	Lagrange's formulae
13 <sup>th</sup>	37 <sup>th</sup>	Numerical Differentiation using Newton's forward
	38 <sup>th</sup>	Numerical Differentiation Using backward difference formulae
	39 <sup>th</sup>	Simpson's 1/3rd rule
14 <sup>th</sup>	40 <sup>th</sup>	Taylor's series
	41 <sup>st</sup>	Runge-Kutta method for solving first and second order equations.
	42 <sup>nd</sup>	Runge-Kutta method for solving first and second order equations.
15 <sup>th</sup>	43 <sup>rd</sup>	Simpson's 1/3rd rule
	44 <sup>th</sup>	Test
	45 <sup>th</sup>	Revision

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