

## Lesson Plan

<b>Name of Teacher:</b> SALAJ		<b>Class:</b> B.Sc. 1(2 <sup>nd</sup> Sem.)
<b>Session:</b> 2022-23 Even Semester		<b>Subject:</b> Ordinary Differential Equations ( Mathematics)
<b>Month</b>	<b>Week</b>	<b>Topic</b>
February	3	Geometrical meaning of a differential equation
	4	Exact differential equations
	1	Integrating factors
	2	First order higher degree equations solvable for x,y,p Lagrange's equations
March	3	Clairaut's equations. Equation reducible to Clairaut's form. Singular solutions.
	4	Orthogonal trajectories: In Cartesian coordinates and polar coordinates. Self orthogonal family of curves
	1	Linear differential equations with constant coefficients..
	2	Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations.
April	3	Reduction to normal form. Transformation of the equation by changing the dependent variable/ the independent variable
	4	Solution by operators of non-homogeneous linear differential equations. Reduction of order of a differential equation
	1	Method of variations of parameters. Method of undetermined coefficients
	2	Ordinary simultaneous differential equations. Solution of simultaneous differential equations involving operators x (d/dx) or t (d/dt) etc. Simultaneous equation of the form $dx/P = dy/Q = dz/R$ .
May	3	Total differential equations. Condition for $Pdx + Qdy + Rdz = 0$ to be exact. General method of solving $Pdx + Qdy + Rdz = 0$ by taking one variable constant
	4	Method of auxiliary equations
	1	Revision
	June	1

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## Lesson Plan

<b>Name of Teacher:</b> SALIAJ		<b>Class:</b> B.Sc.2(4 <sup>th</sup> Sem.)
<b>Session:</b> 2022-23 Even Semester		<b>Subject:</b> Programming in C and Numerical Methods
Month	Week	Topic
February	3	Programmer's model of a computer, Algorithms, Flow charts
	4	Data types, Operators and expressions, Input / outputs.
	1	Decisions control structure: Decision statements
	2	Logical and conditional statements, Implementation of Loops, Switch Statement & Case control structures
March	3	Strings: Character Data Type, Standard String handling Functions
	4	Functions, Preprocessors and Arrays.
	1	Arithmetic Operations on Characters. Structures: Definition
	2	Arrays and Arrays in Structures. Pointers: Pointers Data type
April	3	Pointers and Arrays, Pointers and Functions
	4	Solution of Algebraic and Transcendental equations: Bisection method
	1	Regula-Falsi method, Secant method, Newton-Raphson's method
	2	Newton's iterative method for finding pth root of a number, Order of convergence of above methods.
May	3	Gauss-elimination method, Gauss-Jordan method, Triangularization method (LU decomposition method).
	4	Crout's method,
	1	Cholesky Decomposition method, Jacobi's method, Gauss-Seidal's method, Relaxation method
	1	Revision
June	1	Revision

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## Lesson Plan

<b>Name of Teacher: SAIJAJ</b>		<b>Class: B.Sc.2(4<sup>th</sup> Sem.)</b>
<b>Session: 2022-23 Even Semester</b>		
<b>Month</b>	<b>Week</b>	<b>Subject: Special Functions and Integral Transformations</b>
		<b>Topic</b>
<b>February</b>	3	Series solution of differential equations – Power series method
	4	Series solution of differential equations – Power series method
	1	Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties
	2	Legendre and Hermite differential equations and their solutions: Legendre and Hermite functions and their properties
<b>March</b>	3	Recurrence Relations and generating functions. Orthogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials
	4	Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems
	1	Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms
	2	Convolution theorem, Inverse Laplace transforms
<b>April</b>	2	Inverse Laplace transforms of derivatives and integrals
	3	Solution of ordinary differential equations using Laplace transform
	4	Fourier transforms: Linearity property, Shifting, Modulation
	1	Convolution Theorem, Fourier Transform of Derivatives
<b>May</b>	2	Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms
	3	Solution of differential Equations using Fourier Transforms
	4	
	1	Revision
<b>June</b>	1	

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## Lesson Plan

<b>Name of Teacher:</b> SALAJ		<b>Class:</b> B.Sc. 3 (6 <sup>th</sup> Sem)
<b>Session:</b> 2022-23 Even Semester		<b>Subject:</b> Linear Algebra
Month	Week	Topic
February	3	Vector spaces, subspaces
	4	Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space.
	1	Finely generated vector space, Existence theorem for basis of a finely generated vector space, Finite dimensional vector spaces
	2	Invariance of the number of elements of bases sets, Dimensions, Quotient space and its dimension
March	3	Homomorphism and isomorphism of vector spaces
	4	Linear transformations and linear forms on vector spaces, Vector space of all the linear transformations
	1	Null Space, Range space of a linear transformation
	2	Rank and Nullity Theorem
April	3	Algebra of Linear Transformation, Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations
	4	Matrix of a linear Transformation, Change of basis
	1	Eigen values and Eigen vectors of linear transformations
	2	Inner product spaces, Cauchy-Schwarz inequality, Orthogonal vectors,
May	3	Orthogonal complements, Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces
	4	Gram- Schmidt Orthogonalization process, Adjoint of a linear transformation and its properties, Unitary linear transformations
	1	Revision
	June	

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## Lesson Plan

Name of Teacher: SALAJ		Class: B.Sc. 3 (6 <sup>th</sup> Sem)
Session: 2022-23 Even Semester		Subject: Dynamics
Month	Week	Topic
February	3	Velocity and acceleration along radial, transverse, tangential and normal directions
	4	Relative velocity and acceleration.
	1	Definitions of Conservative forces and Impulsive forces.
	2	Simple harmonic motion
March	3	Elastic strings
	4	Mass, Momentum and Force
	1	Newton's laws of motion
	2	Work, Power and Energy
April	3	Motion on smooth and rough plane curves
	4	Projectile motion of a particle in a plane. Vector angular velocity
	1	General motion of a rigid body. Central Orbits
	2	Kepler laws of motion
May	3	Motion of a particle in three dimensions
	4	Acceleration in terms of different co-ordinate systems
	1	Revision
	June	1

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