Lesson Plan

Name of Teacher: SALAJ		**Class:** B.Sc. 1(2nd Sem.)
Session: 2023-24 Even Semester **Subject: Ordinary Differential Equations (Mathematics)**		
Month	**Week**	**Topic**
January	1	Geometrical meaning of a differential equation,Exact differential equations
	2	Integrating factors
	3	Integrating factors
	4	First order higher degree equations solvable for x,y,p Lagrange's equations
February	1	Clairaut's equations. Equation reducible to Clairaut's form. Singular solutions.
	2	Orthogonal trajectories: in Cartesian coordinates and polar coordinates. Self orthogonal family of curves
	3	Linear differential equations with constant coefficients..
	4	Homogeneous linear ordinary differential equations. Equations reducible to homogeneous linear ordinary differential equations.
March	1	Reduction to normal form. Transformation of the equation by changing the dependent variable/ the independent variable
	2	Solution by operators of non-homogeneous linear differential equations. Reduction of order of a differential equation
	3	Method of variations of parameters. Method of undetermined coefficients
	4	Holi Break
April	1	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.
	2	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
	3	Method of auxiliary equations
	4	Revision

Lesson Plan

Name of Teacher: SALAJ		**Class:** B.Sc.2(4th Sem.)
Session: 2023-24 Even Semester **Subject: Programming in C and Numerical Methods**		
Month	**Week**	**Topic**
January	1	Programmer's model of a computer, Algorithms, Flow charts
	2	Data types, Operators and expressions, Input / outputs.
	3	Decisions control structure: Decision statements
	4	Logical and conditional statements, Implementation of Loops, Switch Statement & Case control structures
February	1	Strings: Character Data Type, Standard String handling Functions
	2	Functions, Preprocessors and Arrays.
	3	Arithmetic Operations on Characters. Structures: Definition
	4	Arrays and Arrays in Structures. Pointers: Pointers Data type
March	1	Pointers and Arrays, Pointers and Functions
	2	Solution of Algebraic and Transcendental equations: Bisection method
	3	Regula-Falsi method, Secant method, Newton-Raphson's method
	4	Holi Break
April	1	Newton's iterative method for finding pth root of a number, Order of convergence of above methods.
	2	Gauss-elimination method, Gauss-Jordan method, Triangularization method (LU decomposition method). Crout's method,.
	3	Cholesky Decomposition method ,Jacobi's method, Gauss-Seidal's method, Relaxation method
	4	Revision

Lesson Plan

Name of Teacher: SALAJ		**Class:** B.Sc.2(4th Sem.)
Session: 2023-24 Even Semester **Subject: Special Functions and Integral Transformations**		
Month	**Week**	**Topic**
January	1	Series solution of differential equations – Power series method
	2	Series solution of differential equations – Power series method
	3	Definitions of Beta and Gamma functions. Bessel equation and its solution: Bessel functions and their properties
	4	Legendre and Hermite differentials equations and their solutions: Legendre and Hermite functions and their properties
February	1	Recurrence Relations and generating functions. Orhogonality of Legendre and Hermite polynomials. Rodrigues' Formula for Legendre & Hermite Polynomials
	2	Laplace Transforms – Existence theorem for Laplace transforms, Linearity of the Laplace transforms, Shifting theorems
	3	Laplace transforms of derivatives and integrals, Differentiation and integration of Laplace transforms
	4	Convolution theorem, Inverse Laplace transforms
March	1	Inverse Laplace transforms of derivatives and integrals
	2	Solution of ordinary differential equations using Laplace transform
	3	Fourier transforms: Linearity property, Shifting, Modulation
	4	Holi Break
April	1	Convolution Theorem, Fourier Transform of Derivatives
	2	Relations between Fourier transform and Laplace transform, Parseval's identity for Fourier transforms
	3	Solution of differential Equations using Fourier Transforms
	4	Revision

Lesson Plan

Name of Teacher: SALAJ		**Class:** B.Sc. 3(6th Sem)
Session: 2023-24 Even Semester **Algebra**		**Subject: Linear**
Month	**Week**	**Topic**
January	1	Vector spaces, subspaces
	2	Sum and Direct sum of subspaces, Linear span, Linearly Independent and dependent subsets of a vector space.
	3	Finitely generated vector space, Existence theorem for basis of a finitely generated vector space, Finite dimensional vector spaces
	4	Invariance of the number of elements of bases sets, Dimensions, Quotient space and its dimension
February	1	Homomorphism and isomorphism of vector spaces
	2	Linear transformations and linear forms on vector spaces, Vector space of all the linear transformations
	3	Null Space, Range space of a linear transformation
	4	Rank and Nullity Theorem
March	1	Algebra of Linear Transformation, Minimal Polynomial of a linear transformation, Singular and non-singular linear transformations
	2	Matrix of a linear Transformation, Change of basis
	3	Eigen values and Eigen vectors of linear transformations
	4	Holi Break
April	1	Inner product spaces, Cauchy-Schwarz inequality, Orthogonal vectors
	2	Orthogonal complements, Orthogonal sets and Basis, Bessel's inequality for finite dimensional vector spaces
	3	Gram- Schmidt Orthogonalization process, Adjoint of a linear transformation and its properties, Unitary linear transformations
	4	Revision

Lesson Plan

Name of Teacher: SALAJ		**Class:** B.Sc. 3(6th Sem)
Session: 2023-24 Even Semester		**Subject: Dynamics**
Month	**Week**	**Topic**
January	1	Velocity and acceleration along radial, transverse, tangential and normal directions
	2	Relative velocity and acceleration.
	3	Definitions of Conservative forces and Impulsive forces.
	4	Simple harmonic motion
February	1	Elastic strings
	2	Mass, Momentum and Force
	3	Newton's laws of motion
	4	Work, Power and Energy
March	1	Motion on smooth and rough plane curves
	2	Projectile motion of a particle in a plane. Vector angular velocity
	3	General motion of a rigid body. Central Orbits
	4	Holi Break
April	1	Kepler laws of motion
	2	Motion of a particle in three dimensions
	3	Acceleration in terms of different co-ordinate systems
	4	Revision