

Panipat Institute of Engineering & Technology
Department of CSE-AI&DS
LESSON PLAN

Subject: MBDO
Session: Aug- Dec 2023-24

Subject code: BS-CS-AIDS-201A
Semester: 3 sem.

| Sr. No. | Lecture No. | Description of Topic | CO Covered | Assignment No. | Teaching Methodology |
|---------|-------------|---|------------|----------------|----------------------|
| 1 | L1 | Unit:1 Introduction, Fourier-Euler Formula | CO1 | 1 | On Board |
| 2 | L2 | Dirichlet's conditions | CO1 | 1 | On Board |
| 3 | L3 | Change of intervals | CO1 | 1 | On Board |
| 4 | L4 | Fourier series for even and odd functions | CO1 | 1 | On Board |
| 5 | L5 | Half range sine and cosine series | CO1 | 1 | On Board |
| 6 | L6 | Fourier Integral theorem, Fourier sine and cosine transforms and its properties, | CO1 | 1 | Online video |
| 7 | L7 | Convolution, Parseval's identity for fourier transforms, Fourier Transform of derivative of a function. | CO1 | 1 | On Board |
| 8 | L8 | Unit-II: First order ordinary differential equations: Exact, linear equations | CO2 | 2 | On Board |
| 9 | L9 | Bernoulli's equations | CO2 | 2 | On Board |
| 10 | L10 | Euler's equations, Equations not of first degree | CO2 | 2 | On Board |
| 11 | L11 | equations solvable for p, equations solvable for y, | CO2 | 2 | On Board |
| 12 | L12 | equations solvable for x and Clairaut's type. | CO2 | 2 | Group Discussion |
| 13 | L13 | Second order linear differential equations with constant coefficients, | CO2 | 2 | On Board |
| 14 | L14 | method of variation of parameters, | CO2 | 2 | On Board |
| 15 | L15 | Cauchy and Legendre's linear differential equations. | CO3 | 2 | On Board |
| 16 | L16 | UNIT-III Solution of polynomial and transcendental equations: Bisection method | CO3 | 1 | On Board |
| 17 | L17 | Newton-Raphson method and Regula-Falsi method | CO3 | 1 | On Board |
| 18 | L18 | Finite differences, | CO3 | 1 | On Board |
| 19 | L19 | Interpolation using Newton's forward and backward difference formulae. | CO3 | 1 | On Board |

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| 20 | L20 | Interpolation with unequal intervals: Lagrange's formulae. | CO3 | 1 | On Board |
| 21 | L21 | Numerical differentiation using forward and backward difference. | CO3 | 1 | On Board |
| 22 | L22 | Numerical Integration: Trapezoidal rule | CO3 | 1 | On Board |
| 23 | L23 | Simpson's 1/3rd and 3/8 rules | CO3 | 1 | Group Discussion |
| 24 | L24 | Ordinary differential equations: Euler and modified | CO3 | 1 | On Board |
| 25 | L25 | Euler's methods. Runge-Kutta method of fourth order for solving first order equations. | CO3 | 1 | On Board |
| 26 | L26 | Runge-Kutta method of fourth order for solving first order equations. | CO4 | 1 | On Board |
| 27 | L27 | Unit IV: Formulation and classification of optimization problems, | CO4 | 3 | Video lecture |
| 28 | L28 | overview of analytical solution of unconstrained optimization problems, constrained optimization, | CO4 | 3 | On Board |
| 29 | L29 | convex set, convex functions, convex optimization problem. | CO4 | 3 | On Board |
| 30 | L30 | Kuhn Tucker condition, | CO4 | 3 | PPT |
| 31 | L31 | Search methods: overview of single variable search methods | CO4 | 3 | On Board |
| 32 | L32 | search methods for multivariable unconstrained problems: | CO5 | 3 | On Board |
| 33 | L33 | search methods for multivariable unconstrained problems: | CO5 | 3 | On Board |
| 34 | L34 | optimality criteria, | CO5 | 3 | On Board |
| 35 | L35 | unidirectional search | CO5 | 3 | On Board |
| 36 | L36 | direct search methods | CO6 | 3 | On Board |
| 37 | L37 | evolutionary search methods | CO6 | 3 | On Board |