



LESSON PLAN

DEPARTMENT: MATHEMATICS AND SCIENCE

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

ACADEMIC SESSION:-2021-22

SEMESTER: - 3RD SEM. WINTER-2021

SUBJECT: - ENGINEERING MATHEMATICS-III

Discipline: Electrical C	Semester: 3rd Semester	Name of the Teaching Faculty: Goutam Parida
Subject: Engineering Mathematics- III	No. of Days/ per week class allotted (Mon, Tue, Wed, Thu)	Semester From: - Date: 01 / 10 / 2021 to 08/ 01/2022 No of Weeks: - 15
Week	Class days & Dates	Theory Topics
1 st		<p>1. Complex Numbers</p> <p>1.1 Real and Imaginary numbers.</p> <p>1.2 Complex numbers, conjugate complex numbers, Modulus and Amplitude of a complex number.</p> <p>1.3 Geometrical Representation of Complex Numbers.</p> <p>1.4 Properties of Complex Numbers.</p> <p>1.5 Determination of three cube roots of unity and their properties.</p> <p>Solve problem on 1.1-1.5</p>
2 nd		<p>1. Complex Numbers</p> <p>1.6 De Moivre's theorem</p> <p>1.7 Solve problems on 1.1 - 1.6</p> <p>2. Matrices</p> <p>2.1 Define rank of a matrix</p> <p>2.2 Perform elementary row transformations to determine the rank of a matrix .</p> <p>2.3 State Rouche's theorem for consistency of a system of linear equations in 'n' unknowns</p>
3 rd		<p>2.4 Solve equations in three unknowns testing consistency.</p> <p>2.5 Solve problems on 2.1 – 2.4</p> <p>3. Linear Differential Equations</p> <p>3.1. Define homogeneous and non – homogeneous Differential Equations with constant coefficients with examples. 3.2. Find general solution of linear equations in terms of C.F. and P.I.</p>

4 th		<p>3.3. Derive rules for finding C.F. And P.I. in terms of operator D, excluding $\frac{1}{f(D)}x^n$ Solve problems on 3.1- 3.3</p> <p>3.4. Define partial differential equation (P.D.E) .</p> <p>3.5 Form partial differential equations by eliminating arbitrary constants and arbitrary functions.</p> <p>3.6 solve partial differential equations of the form $P.p + Q .q = R$</p> <p>Solve problems on 3.3- 3.6</p>
5 th		<p>4. Laplace Transforms</p> <p>4.1 Define Gamma function and $\Gamma(n + 1) = n!$ and find $\Gamma(1/2) = \sqrt{\pi}$.</p> <p>4.2 Define Laplace transform of a function f(t) and inverse Laplace transform .</p> <p>4.3 Derive L.T. of standard functions and explain existence conditions of L.T.</p> <p>4.4 Solve problem on 4.1-4.3</p> <p>4.5. Explain linear, shifting property of L.T.</p> <p>4.6 Formulate L.T. of derivatives, integrals, multiplication by t^n and division by t.</p> <p>solve problem on 4.5 - 4.6</p>
6 th		<p>4. Laplace Transforms</p> <p>4.7 Derive formulae of inverse L.T. and explain method of partial fractions solve problem on 4.1- 4.7</p> <p>5. Fourier Series</p> <p>5.1 Define periodic functions .</p> <p>5.2 State Dirichlet's condition for the Fourier expansion of a function and it's convergence</p>

7 th		<p>5.3 Express periodic function $f(x)$ satisfying Dirichlet's conditions as a Fourier series.</p> <p>5.4 State Euler's formulae</p> <p>5.5 Define Even and Odd functions and find Fourier Series in $(0 \leq x \leq 2\pi \text{ and } -\pi \leq x \leq \pi)$</p>
8 th		<p>5.6 Obtain F.S of continuous functions and functions having points of discontinuity in $(0 \leq x \leq 2\pi \text{ and } -\pi \leq x \leq \pi)$.</p> <p>Solve problems on 5.1 – 5.6</p> <p>6. Numerical Methods</p> <p>6.1 Appraise limitation of analytical methods of solution of algebraic equations .</p> <p>6.2 Derive iterative formula for finding the solutions of algebraic Equations by</p> <p>(a) Bisection method</p>
9 th		<p>(b) Newton- Raphson method</p> <p>6.3 solve problems on 6.1-6.2 .</p> <p>7. Finite difference and interpolation</p> <p>7.1 Explain finite difference and form table of forward and backward difference .</p>
10 th		<p>7.2 Define shift Operator (E) and establish relation between E & difference operator (Δ) .</p> <p>7.3 Solve problems on 7.1- 7.2</p>
11 th		<p>7. Finite difference and interpolation</p> <p>7.4 Derive Newton's forward and backward interpolation formula for equal intervals .</p> <p>7.5 state Lagrange's interpretation formula for unequal intervals</p> <p>7.6 Solve problems on 7.3- 7.4</p>

12 th		7. Finite difference and interpolation 7.7 Explain numerical integration and state 7.5.1 Newton's Cote's formula 7.5.2 Trapezoidal rule 7.5.3 Simpson's 1/3 rd rule 7.8 Solve problems on 7.1- 7.7

PRESCRIBED BOOK: ENGINEERING MATHEMATICS
By B.S. GREWEL

REFERENCE BOOK : ENGINEERING MATHEMATICS -III
By SASMITA MALLICK ,CHITARANJAN MALLICK