



LESSON PLAN

DEPARTMENT: MATHEMATICS AND SCIENCE

BHUBANANANDA ORISSA SCHOOL OF ENGINEERING, CUTTACK

ACADEMIC SESSION:-2023-24

SEMESTER: - 3RD SEM. WINTER-2023

SUBJECT: - ENGINEERING MATHEMATICS-III

Prepared by: Diptimayee Nayak

Diptimayee Nayak
29/07/2023
H.O.D. (Maths & Sc.)

Discipline: AE & I	Semester: 3rd Semester	Name of the Teaching Faculty: Diptimayee Nayak
Subject: Engineering Mathematics- III	No. of Days/ per week class allotted (Mon, Tue, Thu, Sat)	Semester From: - Date: 01 / 08 / 2023 to 30/ 11/2023 No of Weeks: - 17
Week	Class days & Dates	Theory Topics
1st	01.08.23 03.08.23 05.08.23	1. Complex Numbers 1.1 Real and Imaginary numbers. 1.2 Complex numbers, conjugate complex numbers, Modulus and Amplitude of a complex number. 1.3 Geometrical Representation of Complex Numbers.
2nd	07.08.23 08.08.23 09.08.23 12.08.23	1.4 Properties of Complex Numbers. 1.5 Determination of three cube roots of unity and their properties. Solve problem on 1.1-1.5
3rd	14.08.23 17.08.23 19.08.23	1. Complex Numbers 1.6 De Moivre's theorem 1.7 Solve problems on 1.1 - 1.6

4 TH	21.08.23 22.08.23 24.08.23 26.08.23	2. Matrices 2.1 Define rank of a matrix 2.2 Perform elementary row transformations to determine the rank of a matrix . 2.3 State Rouche's theorem for consistency of a system of linear equations in 'n' unknowns
5 TH	28.08.23 29.08.23 31.08.23 02.09.23	2.4 Solve equations in three unknowns testing consistency. 2.5 Solve problems on 2.1 – 2.4 3. Linear Differential Equations 3.1. Define homogeneous and non – homogeneous Differential Equations with constant coefficients with examples.
6 TH	04.09.23 05.09.23 07.09.23 09.09.23	3.2. Find general solution of linear equations in terms of C.F. and P.I. 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

7 TH	11.09.23 12.09.23 14.09.23 16.09.23	4. Laplace Transforms 4.1 Define Gamma function and $\Gamma(n+1) = n!$ and find $\Gamma(1/2) = \sqrt{\pi}$. 4.2 Define Laplace transform of a function $f(t)$ and inverse Laplace transform 4. Laplace Transforms 4.3 Derive L.T. of standard functions and explain existence conditions of L.T.
8 TH	18.09.23 21.09.23 23.09.23	4.3 Solve problem on 4.1-4.3 4.5. Explain linear, shifting property of L.T. 4.6 Formulate L.T. of derivatives, integrals, multiplication by t^n and division by t. solve problem on 4.5 - 4.6
9 TH	25.09.23 26.09.23 28.09.23 30.09.23	4. Laplace Transforms 4.7 Derive formulae of inverse L.T. and explain method of partial fractions solve problem on 4.1- 4.7 5. Fourier Series 5.1 Define periodic functions . 5.2 State Dirichlet's condition for the Fourier expansion of a function and it's convergence

10 th	03.10.23 05.10.23 07.10.23	5.3 Express periodic function $f(x)$ satisfying Dirichlet's conditions as a Fourier series. 5.4 State Euler's formulae 5.5 Define Even and Odd functions and find Fourier Series in ($0 \leq x \leq 2\pi$ and $-\pi \leq x \leq \pi$)
11 th	09.10.23 10.10.23 12.10.23 14.10.23	5.6 Obtain F.S of continuous functions and functions having points of discontinuity in ($0 \leq x \leq 2\pi$ and $-\pi \leq x \leq \pi$). Solve problems on 5.1 – 5.6 6. Numerical Methods 6.1 Appraise limitation of analytical methods of solution of algebraic equations .
12 th	16.10.23 17.10.23 19.10.23	6.2 Derive iterative formula for finding the solutions of algebraic Equations by (a) Bisection method b) Newton- Raphson method
13 th	30.10.23 31.10.23 02.11.23 04.11.23	6.3 solve problems on 6.1-6.2 . 7. Finite difference and interpolation 7.1 Explain finite difference and form table of forward and backward difference

14 TH	06.11.23 07.11.23 09.11.23 11.11.23	7.2 Define shift Operator (E) and establish relation between E & difference operator (Δ). 7.3 Solve problems on 7.1- 7.2 7.4 Derive Newton's forward and backward interpolation formula for equal intervals
15 TH	13.11.23 14.11.23 16.11.23 18.11.23	7. Finite difference and interpolation 7.5 state Lagrange's interpretation formula for unequal intervals 7.6 Solve problems on 7.3- 7.4
16 TH	20.11.23 21.11.23 23.11.23 25.11.23	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
17 TH	28.11.23 30.11.23	7.5.3 Simpson's $1/3^{\text{rd}}$ 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