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 SEC B,	Semester: 3rd Semester	Name of the Teaching Faculty: Dr. Bijayini Nayak
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**
1st	1.10.21 4.10.21 5.10.21	**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. 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
2nd	25.10.21 26.10.21 27.10.21 29.10.21	**1. Complex Numbers** 1.6 De Moivre's theorem 1.7 Solve problems on 1·1 - 1·6 **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
3rd	01.11.21 02.11.21 03.11.21 05.11.21	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. 3.2. Find general solution of linear equations in terms of C.F. and P.I.

4th	08.11.21 9.11.21 10.11.21 12.11.21	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 **3. Linear Differential Equations** 3.4. Define partial differential equation (P.D.E) . 3.5 Form partial differential equations by eliminating arbitrary constants and arbitrary functions. 3.6 solve partial differential equations of the form P.p + Q .q = R Solve problems on 3.3- 3.6
5th	15.11.21 16.11.21 17.11.21	**4. Laplace Transforms . 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 4.3 Derive L.T. of standard functions and explain existence conditions of L.T. 4.4 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
6th	22.11.21 23.11.21 24.11.21 26.11.21	**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

7th	29.11.21 30.11.21 1.12.21 3.12.21	**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* $-\pi \leq x \leq \pi$)
8th	6.12.21 7.12.21 8.12.21 10.12.21	**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 . 6.2 Derive iterative formula for finding the solutions of algebraic Equations by (a) Bisection method
9th	13.12.21 14.12.21 15.21.21 17.12.21	(b) Newton- Raphson method 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 .
10th	20.12.21 21.12.21 22.12.21 24.12.21	**7.2** Define shift Operator (E) and establish relation between E & difference operator (Δ) . **7.3** Solve problems on 7.1- 7.2
11th	27.12.21 28.12.21 29.12.21 31.12.21	**7. Finite difference and interpolation** **7.4** Derive Newton's forward and backward interpolation formula for equal intervals . **7.5** state Lagrange's interpretation formula for unequal intervals **7.6** Solve problems on 7.3- 7.4

12th	3.1.22 4.1.22 5.01.22 07.01.22	**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 1/3rd 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