

PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF
ENGINEERING & TECHNOLOGY, BARGARH



LESSON PLAN

Session: 2023-24

3rd Semester, Electrical Engineering

Engineering Mathematics-III (TH-1)

Mr. Shubhranshu Kumar Sahu

Sr. Lect. in Mathematics

Subject: Engineering Mathematics-IIINo. of Days/per week class allotted 04Semester From Date :01-08-2023 To Date :30-11-2023No. of Weeks : 15

| Week | Class Day | Theory /Practical Topics |
|------|-----------|---|
| 1st | 1 | Complex Numbers (Define Real and Imaginary numbers), Integral power of i |
| | 2 | Algebraic Operations with complex numbers (Additions, Subtractions, Multiplications & Divisions) |
| | 3 | Conjugate, Modulus and Amplitudes of a Complex numbers. |
| | 4 | Geometrical Representation of complex number and square roots of a complex number. |
| 2nd | 1 | Cube roots of unity and their properties. |
| | 2 | De Moivre's Theorem and solve problems. |
| | 3 | Basic concepts and Rank of matrix. |
| | 4 | Elementary row transformation to determine Rank of matrix |
| 3rd | 1 | State Rouche's Theorem for consistency of a system of linear equations in n unknowns, |
| | 2 | Linear equations in three unknowns testing consistency. |
| | 3 | Linear Differential Equation, Homogeneous and Non-homogeneous diff. equations with constant coefficients. |
| | 4 | General solution of linear diff. equations in terms of C.F. and P.I. |

Signature of the Faculty
7. 2023

| Week | Class Day | Theory /Practical Topics |
|------|-----------|--|
| 4th | 1 | Rules of finding C.F. and P.I. in terms of operation D. |
| | 2 | Solve problems. |
| | 3 | Solve problems. |
| | 4 | Solve problems. |
| 5th | 1 | Partial diff. equations by eliminating arbitrary constants and eliminating arbitrary function. |
| | 2 | Partial diff. equations of the form $Pp + Qq = R$ |
| | 3 | Solve problems. |
| | 4 | Solve problems. |
| 6th | 1 | Gamma function, $\Gamma(n+1)$ and find $\Gamma(1/2)$ |
| | 2 | Laplace Transformation of a function $f(t)$ and transforms of elementary function. |
| | 3 | Linearity, shifting and change of scale property of Laplace Transforms. |
| | 4 | Laplace transforms of derivatives. |

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 27.11.2023

| Week | Class Day | Theory /Practical Topics |
|------|-----------|---|
| 7th | 1 | Solve problems. |
| | 2 | Laplace Transforms of Integrals. |
| | 3 | Multiplication by t^n |
| | 4 | Division by t |
| 8th | 1 | Evaluation of Integrals by Laplace Transforms. |
| | 2 | Solve problems. |
| | 3 | Formulae of inverse Laplace Transforms. (Method of partial fraction) |
| | 4 | Solve problems. |
| 9th | 1 | Appraise limitation of analytical methods of solution of Algebraic Equations. |
| | 2 | Derive Iterative formulae for finding the solutions of Algebraic Equations by |
| | 3 | a) Bisection Method and Solve problems. |
| | 4 | b) Newton-Raphson Method and Solve problems. |

Signature of the Faculty
27.7.2023

| Week | Class Day | Theory /Practical Topics |
|------|-----------|---|
| 10th | 1 | Finite differences and form table of forward with example. ↓ |
| | 2 | And backward difference with examples. |
| | 3 | Factorial Notation and Solve problems. |
| | 4 | Define shift operation (E) and establish relation between E and difference operator(s). |
| 11th | 1 | Derive Newton's forward and backward interpolation formula for equal intervals. |
| | 2 | Solve problems. ↓ |
| | 3 | Solve problems. |
| | 4 | Solve problems. |
| 12th | 1 | Inverse interpolation(Lagrange's interpolation formulae for unequal intervals) |
| | 2 | Solve problems. |
| | 3 | Numerical Integration a) Newton's Cote's formulae. |
| | 4 | b) Trapezoidal Rule and c) Simpson's 1/3 Rule and Solve problems. |

| Week | Class Day | Theory /Practical Topics |
|------|-----------|--|
| 13th | 1 | Define periodic functions. |
| | 2 | Euler's formulae (state and solve problems) |
| | 3 | Solve problems. |
| | 4 | Solve problems. |
| 14th | 1 | Dirichlet's conditions for a Fourier expansion. |
| | 2 | Obtain Fourier Series of continuous functions and functions having points of discontinuity and solve problems. |
| | 3 | Solve problems. |
| | 4 | Change of Intervals and Solve problems. |
| 15th | 1 | Solve problems. |
| | 2 | Define odd and even functions with examples. |
| | 3 | Solve problems. |
| | 4 | Solve problems. |