

GOVERNMENT POLYTECHNIC, NUAPADA

LESSON PLAN

Discipline:	Semester:	Name of the Teaching Faculty:
Electrical Engg.	3rd	Manas Ranjan Sahu (Lect. in Mathematics)
Subject:	No of Days/per week class allotted: 4P	Semester From Date: 01.08.2023 to Date: 30.11.2023
Th-1: Engg. Math-III		No. of Weeks: 17 Total Number of Allotted Classes: 61
Week	Class Day	Theory Topics
1st	1st(01.08.2023)	1. <u>COMPLEX NUMBER</u> Arrival of complex number. Introduction of i (iota) and its properties. Representation of complex number. Conjugate of a complex number and its properties.
	2nd(03.08.2023)	Modulus, Amplitude of a complex number and its properties. Representation of a Complex Number.
	3rd(04.08.2023)	Cube roots of Unity and its properties
2nd	1st(07.08.2023)	Square roots of a complex Number
	2nd(08.08.2023)	De Moivre's Theorem and its application
	3rd(10.08.2023)	Solve problems on TBE(Text Book Exercise)
	4th(11.08.2023)	2. <u>MATRICES</u> Define rank of a matrix with examples.
3rd	1st(14.08.2023)	Perform elementary row transformations to determine the rank of a matrix.
	2nd(17.08.2023)	State Rouché's theorem for consistency of a system of linear equations in unknowns.
	3rd(18.08.2023)	Solve equations in three unknowns testing consistency.
4th	1st(21.08.2023)	3. <u>LINEAR DIFFERENTIAL EQUATIONS</u> Define Homogeneous & Non-Homogeneous linear Differential Equations with constant coefficients with example. General Solution of LDE in terms of C.F and P.I. Rules for Finding the Complementary Function (y_c). Case-I(Roots of A.E. are real and distinct)
	2nd(22.08.2023)	Case-II(Roots of A.E. are real and repeated) Case-III (Roots of A.E. are imaginary) Case-IV (Combined case of all the above 3 cases)
	3rd(24.08.2023)	Rules For finding Particular integral(y_p) or Complete Solution($y_c + y_p$). $F(D)y = f(x) \Rightarrow y_p = \frac{f(x)}{F(D)}$

		Case-I ($f(x) = x^n$ form) Case-II ($f(x) = e^{ax}$, such that $F(a) \neq 0$.) Case-III ($f(x) = e^{ax}$, such that $F(a) = 0$)
	4th(25.08.2023)	Case-IV ($f(x) = \sin(ax+b)$ or $\cos(ax+b)$ such that $F(-a^2) \neq 0$) Case-V ($f(x) = \sin(ax+b)$ or $\cos(ax+b)$ such that $F(-a^2) = 0$)
5th	1 st (28.08.2023)	Case-VI ($f(x) = e^{ax}V$, V is function of x) Case-VII ($f(x) = xV$)
	2 nd (29.08.2023)	Solve problems on TBE(Text Book Exercise)
	3 rd (31.08.2023)	Partial Differential Equation (PDE): Order and degree of PDE. Formation of a PDE
	4 th (01.09.2023)	Formation of PDE
6th	1 st (04.09.2023)	Solve Linear Equation of first order: $Pp+Qq=R$
	2 nd (05.09.2023)	Solve problems on TBE(Text Book Exercise)
	3 rd (07.09.2023)	4. LAPLACE TRANSFORMS Definition: Gamma Function, Properties of Gamma Function with examples
	4 th (08.09.2023)	Definition of Laplace Transform of $f(t)$. Linear Property. Evaluation of Laplace Transformation of some standard/Elementary Functions ($f(t) = k$ or t^n or e^{at} or e^{-at} or $\sinh at$ or $\cosh at$ or $\sin at$ or $\cos at$)
7th	1 st (11.09.2023)	Simple Use Laplace transform of Standard formula.
	2 nd (12.09.2023)	Shifting Theorems/ Property Change of Scale Property
	3 rd (14.09.2023)	Application of Using Shifting Property
	4 th (15.09.2023)	Transform of $e^{at} f(t), t^n f(t), \frac{1}{t} f(t)$ with Example
8th	1 st (18.09.2023)	Formulate Laplace transform of Derivatives, integrals, multiplication by t^n and division by t with example
	2 nd (21.09.2023)	-DO-
	3 rd (22.09.2023)	Define: Inverse Laplace Transform (ILT). Formula for standard function
9th	1 st (25.09.2023)	ILT by method of partial fraction
	2 nd (26.09.2023)	-Do-
	3 rd (28.09.2023)	Solve problems on TBE(Text Book Exercise)
10th	1 st (03.10.2023)	5. FOURIER SERIES Define Periodic Functions with graphs. Even/Odd Functions. Dirichlet Function
	2 nd (05.10.2023)	Define Fourier Series and its notations. Euler formula for Fourier Series
	3 rd (06.10.2023)	Workout Examples
11th	1 st (09.10.2023)	Dirichlet Condition for the expansion of Fourier series and its convergent
	2 nd (10.10.2023)	Problem Solving on previous class
	3 rd (12.10.2023)	Problem Solving on previous class
	4 th (13.10.2023)	Problem Solving on previous class
12th	1 st (16.10.2023)	Fourier Series of Even/Odd functions in

		$(0 \leq x \leq 2\pi \text{ and } -\pi \leq x \leq \pi)$
	2 nd (17.10.2023)	Problem Practice of previous class
	3 rd (19.10.2023)	Fourier Series of Continuous functions and functions having point of discontinuous in $(0 \leq x \leq 2\pi \text{ and } -\pi \leq x \leq \pi)$
	4 th (20.10.2023)	Problem Practice of previous class
13th	1 st (30.10.2023)	Solve problems on TBE(Text Book Exercise) and previous year questions
	2 nd (31.10.2023)	6. NUMERICAL METHODS
	3 rd (02.11.2023)	Limitation of analytical methods of solution of Algebraic Equation. Derive iterative formula for finding the solutions of Algebraic Equation by I- Bisection Method
	4 th (03.11.2023)	II- Newton-Raphson Method
14th	1 st (06.11.2023)	Solve problems on TBE(Text Book Exercise)
	2 nd (07.11.2023)	7. FINITE DIFFERENCE & INTERPOLATION
	3 rd (09.11.2023)	Formation of Forward (Δ) and Backward (∇) Difference table. Define: Shift operator (E). Relation among the operators
	4 th (10.11.2023)	Newton's forward and backward interpolation for equal interval
15th	1 st (13.11.2023)	Problem Solving on previous class
	2 nd (14.11.2023)	Problem Solving on previous class
	3 rd (16.11.2023)	Lagrange Interpolation formula for unequal intervals
	4 th (17.11.2023)	Problem Solving on previous class
16th	1 st (20.11.2023)	Explain Numerical Integration. 1. Newton's Cote's formula
	2 nd (21.11.2023)	Problem Solving on previous class
	3 rd (23.11.2023)	2. Trapezoidal Rule. Solving problems
	4 th (24.11.2023)	3. Simpson's 1/3 rd rule. Solving Problems.
17th	1 st (28.11.2023)	Problem Solving on previous class
	2 nd (30.11.2023)	Problem Solving on previous class

Teaching Faculty

Program Coordinator (E.E)

Academic Coordinator

Principal
Government Polytechnic
Nuapada