DISCIPLINE : All Branches	SEMESTER : 3rd	NAME OF THE TEACHING FACULTY : Anirudha panda, subhalaxmi saha
SUBJECT : ENGG. MATH-III	NO. OF DAYS/PER WEEK CLASS ALLOTTED:04	SEMESTER FROM DATE : 15/09/2022 TO DATE : 22/12/2022 NO. OF WEEKS : 15
WEEK :	**CLASS DAY :**	**THEORY TOPIC :**
1ST (Complex Numbers)	1ST	Real and Imaginary numbers, Complex Numbers.
	2ND	Conjugate complex numbers, Modulus and Amplitude of a complex number.
	3RD	Geometrical representation of complex number, Properties of Complex Numbers.
	4TH	Determination of three cube roots of unity and their properties.
2nd (Complex Numbers) + (Matrices)	1ST	De Moivre's theorem.
	2nd	Solved problems.
	3rd	Basic concepts of matrices and Operation
	4th	Sub matrix and Minors and Rank of a matrix.
3RD (Matrices)+ (Numerical Methods)	1st	Elementary transformation and Row Reduction Echelon Matrix.
	2nd	System of Linear Equations and their consistency and solutions.
	3rd	Introduction and Rounding off; Synthetic division of polynomials, Different types of Equations and their solution.
	4th	Method of Bisection for solving equations.
4TH (Numerical Methods) + (Differential Equations)	1st	Solving equation by Newton Rap son Method.
	2nd	Formula deduced from Newton- Rap son .method and solving Numericals based on their formulas .
	3rd	Introduction; order and degree and solution of 1st order,1st degree Equation .Exact Equations and their solutions.
	4th	Linear Equations and their solution. Rules for finding complementary function. Solving various numerical to get complementary function.

WEEK :	CLASS DAY :	THEORY TOPIC :
5TH (Differential Equation)	1ST	Rules for getting particular integer of the type of function e^{ax+b} and Numericals based on it.
	2ND	Rules for getting P.I of the hyperbolic function $\sin(ax+b)$ or $\cos(ax+b)$ and solving numerical based on it.
	3RD	Rules for getting P.I if the function is x^m ; m>0 and solving numerical based on it.
	4TH	Rules for finding P.I if the function is $e^{ax}V$, where V is the function of x(1st shifting theorem).

6TH (Differential Equation)	1ST	Rules for finding P.I if the function is any other function given above.
	2nd	Rules for finding P.I for special cases.
	3rd	Partial differential Equations of 1st and 2nd order and their formation.
	4th	Solving linear partial differential equations of 1st order by Lagranges method and multipliers
7th(Finite Difference & Interpolation)	1st	Introduction to finite difference and forming Forward and Back Difference table.
	2nd	Definition of shift operator (E) and Establish relation between E and the difference operator.
	3rd	Interpolation and Extrapolation, Newton's forward Difference Interpolation formula.
	4th	Problems based on Newton's Forward Difference Interpolation formula.
8th(Finite Difference & Interpolation)	1st	Newton's Backward Difference Interpolation formula.
	2nd	Problems based on Newton's Backward Difference Interpolation formula.
	3rd	Lagrange's Interpolation Formula and numerical based on it.
	4th	Inverse interpolation Formula and problems based on it.
9th(Finite Difference & Interpolation)	1ST	Definition of Numerical integration and Newton's Cote's Formula.
	2ND	Trapezoidal Rule and solving problems based on it.
	3RD	Simpson's $\frac{1}{3}$rd Rule and problems based on it.
	4TH	Comparison of both methods.
10th(Laplace Transform)	1ST	Gamma function and its properties.
	2nd	Laplace Transformation of a function f(t), Existence of L.T and Linearity properties
	3rd	L.T of a const; L.T of t^n, n=+ve (integral), n= (fraction), L.T of e^{at} Problems on it.
	4th	L.T of cos nat, sin nat, L.T of cos at,sin at, Application of it.
11th(Laplace Transform)	1st	L.T of Discontinuous functions and problems based on it.
	2nd	First shifting Theorem and Numericals. Second Shifting Theorem and Numericals based on it.
	3rd	Change of scale property and problems based on it. L.T of $e^{at}f(t)$, $t^n f(t)$, $\frac{1}{t}f(t)$, different problems based on it.
	4th	Laplace Transform of the nth derivatives. L.T of the integer and example on it.
12th(Laplace Transform)	1st	Inverse L.T and formula derived from Laplace Transformation.
	2nd	Inverse Laplace Transformation, Partial Fraction Method.

	3rd	$L^{-1}[\frac{F(S)}{S}]$, $L^{-1}\{F^n(S)\}$.
	4th	Solving Differential Equation in the Method of Laplace Transformation.
13th(Fourier Series)	1ST	Periodic function , Even and odd functions, Some useful integrals.
	2ND	Dirichlet's condition for the Fourier expansion of a function and its convergence.
	3RD	Periodic function f(x) satisfying Dirichlet's condition on a Fourier series.
	4TH	Definition of Fourier series and Euler's formula.
14th(Fourier Series)	1ST	F.S of simple function x and Deducing formulae from it.
	2nd	F.S of $x - x^2$, $x + x^2$, e^x, e^{-x} .
	3rd	Fourier series of some Trigonometry functions.
	4th	Fourier series of functions we can be deduced from the above trigonometry functions.
15th(Fourier Series)	1st	Examples of Discontinuous function.
	2nd	Fourier Series of Even functions.
	3rd	Fourier series of Odd functions.
	4th	Different Problems based on Fourier series.