Discipline: Electrical Engg.	Semester: 3rd	Name Of The Teaching Faculty: Suraj Kumar Garada
Subject: Engg. Mathematics III (Th-1)	**No. of days/week class allotted: 4**	**No. of weeks:15** **Semester from: 06/11/21 to 08/01/22**
Week	**Class Day**	**Theory Topics**
1st	1st	**Chapter 1: COMPLEX NUMBERS** Real and imaginary numbers
	2nd	Complex numbers, conjugate complex numbers, modulus and amplitude of a complex number
	3rd	Geometrical representation of complex numbers
	4th	Properties of complex numbers
2nd	1st	Determination of three cube roots of unity and their properties
	2nd	De moivre's theorem
	3rd	**Chapter 2: MATRICES** Define rank of a matrix.
	4th	Perform elementary row transformations to determine the rank of a matrix
3rd	1st	State rouche's theorem for consistency of a system of linear equations in *n* unknowns.
	2nd	Solve equations in three unknowns testing consistency
	3rd	**Chapter 3: LINEAR DIFFERENTIAL EQUATIONS** Define homogeneous and non–homogeneous linear differential equations with constant coefficients with examples
	4th	Auxiliary equation for linear differential equations with examples
4th	1st	Complementary function(c.f) for homogeneous linear differential equations with examples
	2nd	Find general solution of linear differential equations in terms of c.f. and p.i
	3rd	Derive rules for finding c.f. and p.i. in terms of operator d
	4th	Particular integral(p.i) for non–homogeneous linear differential equations with examples

5th	1st	Particular integral(p.i) for non–homogeneous linear differential equations with examples
	2nd	Define partial differential equation (p.d.e)
	3rd	Form partial differential equations by eliminating arbitrary constants and arbitrary functions.
	4th	Solve partial differential equations of the form pp + qq = r
6th	1st	**Chapter 4: LAPLACE TRANSFORMS** Define gamma function and $\Gamma(n)$=$(n+1)$!
	2nd	Find $\Gamma\left(\frac{1}{2}\right)=\sqrt{\pi}$
	3rd	Define laplace transform of a function $f(t)$
	4th	Derive l.t. of standard functions and explain existence conditions of l.t
7th	1st	Linear and shifting property of l.t
	2nd	Laplace transformation of some elementary functions
	3rd	Formulate l.t. of derivatives, integrals, multiplication by $t^n$and division by t
	4th	Solve problems on laplace transformation
8th	1st	Define inverse laplace transform of a function
	2nd	Derive formulae of inverse l.t.
	3rd	Explain method of partial fractions
	4th	Problems oninverse laplace transform
9th	1st	**Chapter 5:FOURIER SERIES** Define periodic functions with examples
	2nd	State dirichlet's condition for the fourier expansion of a function and it's convergence
	3rd	Express periodic function $f(x)$satisfying dirichlet's conditions as a fourier series
	4th	State euler's formulae
10th	1st	Formulae for fourier series coefficients
	2nd	Problems on finding fourier series coefficients
	3rd	Problems on finding fourier series coefficients
	4th	Problems on finding fourier series coefficients

11th	1st	Define even and odd functions
	2nd	Find fourier series of even and odd functions in ($0 \leq x \leq 2\pi$ and $-\pi \leq x \leq \pi$)
	3rd	Obtain fourier series of continuous functions in ($0 \leq x \leq 2\pi$ and $-\pi \leq x \leq \pi$)
	4th	Obtain fourier series of functions having points of discontinuity ($0 \leq x \leq 2\pi$ and $-\pi \leq x \leq \pi$)
12th	1st	**Chapter 6: NUMERICAL METHODS** Appraise limitation of analytical methods of solution of algebraic equations
	2nd	Derive iterative formula for finding the solutions of algebraic equations by bisection method
	3rd	Derive iterative formula for finding the solutions of algebraic equations by secant and regula-falsi method
	4th	Derive iterative formula for finding the solutions of algebraic equations by newton- raphson method
13th	1st	**Chapter 7: FINITE DIFFERENCE AND INTERPOLATION** Explain finite difference
	2nd	Form table of forward difference.
	3rd	Form table of backward difference.
	4th	Define shift operator(e) and establish relation between e& difference operator(Δ)
14th	1st	Problems based on these finite difference operators
	2nd	State lagrange's interpretation formula for unequal intervals
	3rd	Derive newton’s forward interpolation formula for equal intervals
	4th	Derive newton’s backward interpolation formula for equal intervals
15th	1st	Explain numerical integration
	2nd	Newton’s cote's formula
	3rd	Trapezoidal rule
	4th	Simpson’s 1/3rd rule