Name of Assitant: Dr. Suman
Class: B.A 2nd Sem
Subject: Algebra And Number Theory

Week / Months	Topics / chapters to be covered
January 2025 Week 1st	Symmetric, skew symmetric, Hermitian and skew Hermitian matrices, Elementary operations on matrices, Rank of a matrix, Inverse of a matrix, Linear dependance and independence of rows and colums of matrix.
Week 3rd	Row rank and column rank of a matrix, Eigen Values, Eigen Vectors and characteristics equation of a matrix, Minimal Polynomial of a matrix.
Week 4th	Cayley-Hamilton theorem and its use in finding the Inverse of a matrix, Unitary and Orthogonal matrices.
Febraury 2025 1st Week	Relations between the roots and coefficients of general Polynomial equations in one Variable.
2nd Week	Solutions of Polynomial equations having conditions on roots, Common roots and multiple roots.
3rd Week	Transformation of Equations.
4th Week	Nature of the roots of an equation, Descarte's rule of signs.
March 2025 1st Week	Solutions of cubic equations, (Cardon's method), Biquadratic equations and their solutions.

Weak/Month	Topics/chapters to be Covered
3rd Weak	Divisibility, Greatest common divisor (gcd), Least common multiple (Lcm).
4th Week	Prime numbers, fundamental theorem of arithmetic
April 2025 1st Week	Linear Congruences, Fermat's theorem, Euler's theorem
2nd Week	Wilson's theorem and its converse, Chinese Remainder theorem.
3rd Week	Linear Diophantine equations in two Variables.
4th Week	Revision

SUMAN

Name of Assistant : Dr. Suman
Class : B.A & B.S.C 4th Sem
Subject : Special functions and Integral transforms

Week/Month	Topics/Chapters to be Covered
January 2025 1st Week	Power Series: Convergence of Power Series, Interval of Convergence, shifting of Summation Index, Analytic function, Ordinary and Singular Points of differential Equations
3rd Week	Existence of power series Solution, Frobenius method
4th Week	Bessel's Equation and function: Bessel's Equation, Solution of Bessel's Equation, Bessel's function, Recurrence Relations for Bessel's functions, Generating function for $J_n(x)$, Representation of $J_n(x)$ Integral
February 2025 1st Week	Legendre's Equation: Legendre's Equation, Solution of Legendre's Equation, Legendre's polynomial, derivation of Legendre's Polynomials from Rodrigue Formula, Orthogonality of Legendre Polynomial.
2nd Week	Hermite's Equation: Hermite's equation, Solution of Hermite's Equation, Hermite's Polynomial, Hermite's Polynomial for Some Value of n, Generating function For Hermite's Polynomial.
3rd Week	Rodrigue's Formula For $H_n(x)$, another formula For $H_n(x)$, Recurrance Relations, Orthogonal Property of Hermite's Polynomial
4th Week	Laplace Transforms : Laplace Transformation, Laplace Transform of Some Elementary functions, Linear Property of Laplace Transform.
March 2025 1st Week	First shifting Property, Some standard rule obtained by applying shifting property, change of Scale Property, Unit step function, Second shifting theorem, Laplace Transform of n^{th} Order derivative of $f(t)$, Laplace Transform of Integrals, Some Important functions

Subject: Real and Complex Analysis

Week/Month	Topic/chapters to be Covered
3rd Week	Inverse Laplace Transforms: Inverse Laplace Transform, other Method for finding Inverse Transforms, Convolution Theorem, Proof also.
4th Week	Use of laplace Transforms in integral Equations: application, Integral Equation, application of Laplace Transformation to integral Equations.
April 2025 Week 1st	Fourier Transforms: The infinite Fourier Transform of $f(t)$, inverse formula, the infinite Fourier Sine Transform, inverse formula, the infinite fourier Cosine Transform, Properties of fourier Transform.
Week 2nd	Linear Property, change of Scale Property, shifting Property, modulation Property, Convolution, Convolution Theorem for fourier Transform, Fourier Transforms of the Derivative, Relation b/w Fourier and Laplace Transform, Parseval's identity for Fourier Transform.
Week 3rd	Parseval's identities For Fourier Sine and Cosine Transform, The finite Sine & Cosine Transform of $f(x)$ Solution of differential Equations by Fourier Transform: method to solve Type of Equations
4th Week	Revision

SUMAN

Name of Assistant: Dr. Suman
Class: B.A 6th Sem
Subject: Real and Complex Analysis

Week/Month	Topic/chapter to be Covered
January 2025 Week 1st	Jacobians, Beta and Gamma functions
3rd Week	Double and Triple integrals, Dirichlets integrals
4th Week	change of Order of Integration in double integrals.
February 2025 Week 1st	Fourier Series: Fourier expansion of Piecewise monotonic functions, Properties of Fourier co-efficients.
Week 2nd	Dirichlet's Conditions, Parseval's identity For Fourier Series.
Week 3rd	Fourier Series for even and odd functions.
Week 4th	Half range Series change of Intervals.
March 2025 Week 1st	Extended Complex plan Stereographic Projection of complex numbers
3rd Week	Continuity and differentiability of Complex functions, Analytic functions
4th Week	Cauchy's-Riemann equations Harmonic functions

Week | Month	Topics/chapter to be Covered
April 2025 1st Week	Mappings by Elementary functions: Translation, rotation, magnification and Inversion
2nd Week	Conformal Mappings, Mobius Transformations, Fixed points.
3rd Week	Cross Ratio, Inverse and Critical Point mappings.
4th Week	Revision

SUMAN