

GOVT. POST GRADUATE NEHRU COLLEGE, JHAJJAR

Department of Mathematics (2025-26)

Lesson Plan 2025-2026(EVEN SEM)

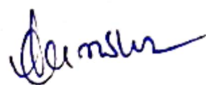
Class MSc. Mathematics

Semester -IV

Name of Teacher...Samsheer

Subject/Paper- Inner Product Space & Measure Theory

Sr. No.	Week Days	Subject Matter/ Syllabus
Unit-1	January	Hilbert Spaces: Inner product spaces, Hilbert spaces, Schwarz inequality, Hilbert space as normed linear space, Convex sets in Hilbert spaces, Projection theorem, Orthonormal sets, Separability, Total Orthonormal sets, Bessel inequality, Parseval identity.
Unit-2	February	Conjugate of a Hilbert space, Riesz representation theorem in Hilbert spaces, Adjoint of an operator on a Hilbert space, Reflexivity of Hilbert space, Self-adjoint operators, Positive operators, Product of Positive Operators.
Unit-3	March	Projection operators, Product of Projections, Sum and Difference of Projections, Normal and unitary operators, Projections on Hilbert space, Spectral theorem on finite dimensional space. Convex functions, Jensen inequalities, Measure space, Generalized Fatou lemma, Measure and outer measure, Extension of a measure, Caratheodory extension theorem.
Unit-4	1 st April to to 6 th May	Signed measure, Hahn decomposition theorem, Jordan decomposition theorem, Mutually signed measure, Radon - Nikodyn theorem, Lebesgue decomposition, Lebesgue - Stieltjes integral, Product measures, Fubini theorem, Baire sets, Baire measure, Continuous functions with compact support.



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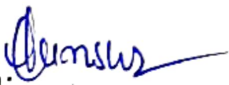
Class MSc. Mathematics

Semester - 2nd

Name of Teacher...Samsheer

Subject/Paper- Theory of Field Extension

Sr. No.	Week Days	Subject Matter/ Syllabus
Unit-1	January	Extension of fields: Elementary properties, Simple Extensions, Algebraic and transcendental Extensions. Factorization of polynomials.
Unit-2	February	Splitting fields, Algebraically closed fields, Separable extensions, Galois fields, Perfect fields. Section-.
Unit-3	March	Galois theory: Automorphism of fields, Monomorphisms and their linear independence, Fixed fields.
Unit-4	1 st April to to 6 th May	Normal extensions, Normal closure of an extension, The fundamental theorem of Galois theory.


Signature