Lesson Plan

Class- M.Sc.

Semester - 2nd

Name of Assistant/Associate- Mr. Samsher

Subject/Paper - Theory of Field Extensions

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	January	Extension of fields: Elementary properties, Simple Extensions, Algebraic and transcendental Extensions. Factorization of polynomials, Splitting fields, Algebraically closed fields, Separable extensions, Perfect fields. Open class discussion,Class test,Assignment
Unit-2	February	Galios theory: Automorphism of fields, Monomorphisms and their linear independence, Fixed fields, Normal extensions, Normal closure of an extension, The fundamental theorem of Galois theory, Norms and traces. Open class discussion,Class test,Assignment
Unit-3	March	Normal basis, Galios fields, Cyclotomic extensions, Cyclotomic polynomials, Cyclotomic extensions of rational number field, Cyclic extension, Wedderburn theorem. Open class discussion,Class test,Assignment
Unit-4	April	Ruler and compasses construction, Solutions by radicals, Extension by radicals, Generic polynomial, Algebraically independent sets, Insolvability of the general polynomial of degree $n \geq 5$ by radicals Open class discussion,Class test,Assignment

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Lesson Plan

Class- M.Sc.

Semester – 4th

Name of Assistant/Associate- Mr.Samsher

Subject/Paper - Inner Product Spaces and Measure Theory

Sr. No.	Duration	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. Open class discussion,Class test,Assignment
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. Open class discussion,Class test,Assignment
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. Open class discussion,Class test,Assignment
Unit-4	April	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. Open class discussion,Class test,Assignment

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LESSON PLAN

Class- B.Sc.

Semester - 6th

Name of Assistant/Associate- Mr. Samsher

Subject/Paper - Real and Complex Analysis

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	January	Jacobians, Beta and Gama functions, Double and Triple integrals, Dirichlets integrals, change of order of integration in double integrals. Open class discussion, Class test, Assignment
Unit-2	February	Fourier's series: Fourier expansion of piecewise monotonic functions, Properties of Fourier Co-efficients, Dirichlet's conditions, Parseval's identity for Fourier series,Fourier series for even and odd functions, Half range series, Change of Intervals. Open class discussion,Class test,Assignment
Unit-3	March	Extended Complex Plane, Stereographic projection of complex numbers, continuity and differentiability of complex functions, Analytic functions, Cauchy-Riemann equations. Harmonic functions. Open class discussion,Class test,Assignment
Unit-4	April	Mappings by elementary functions: Translation, rotation, Magnification and Inversion. Conformal Mappings, Mobius transformations. Fixed pints, Cross ratio, Inverse Points and critical mappings Open class discussion,Class test,Assignment

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