

Courses Description

College: Science

Department: Mathematics

Couse ID: 2201011701 **Description:** Advanced Applied Mathematics (1)

Full Course Description: Boundary value Problems for ordinary differential equations, Sturm-Liouville theory, generalized Fourier series, eigenfunction expansion, Laplace and Fourier transforms, Green's functions, systems of differential equations and stability.

Couse ID: 2201011702 **Description:** Advanced Applied Mathematics (2)

Full Course Description: 2201011702 Advanced Applied Mathematics (2) : 3 C.H (3+0), prerequisite (2201011701)□
Boundary value Problems for partial differential equation, integral transforms, integral equations, calculus of variation, asymptotic methods, generalized functions. □

Couse ID: 2201011703 **Description:** Numerical Analysis

Full Course Description: 2201011703 Numerical Analysis : 3 C.H (3+0)□
Analysis of direct and iterative methods for the solution of linear systems, linear least squares problems, eigenvalue problems, error analysis and reduction by orthogonal transformations.□

Couse ID: 2201011711 **Description:** Advanced Real Analysis (1)

Full Course Description: 2201011711 Advanced Real Analysis(1) : 3 C.H (3+0)□
Lebesgue outer measure, Lebesgue measurable sets, Egoroff's theorem, Lusini theorem, measurable functions, convergence in measur, comparison of Riemann integrals and Lebesgue integral, integral of non-negative measurable functions, general Lebesgue integrals, improper integrals, functions of bounded variation, differentiation of an integral, Lp-spaces, dominated convergence theorem, Fatou's lemma.□

Couse ID: 2201011712 **Description:** Advanced Real Analysis (2)

Full Course Description: 2201011712 Advanced Real Analysis (2): 3 C.H (3+0), prerequisite (2201011711)□
Measure spaces, finite, measurable functions, integration, the classes Lp, outer measure, extension theorem, signed measure, Hahn decomposition, Jordan decomposition, absolute continuity of measures and signed measure, Radon-Nikodym theorem, Lebesgue decomposition, derivatives of signed measure, product spaces, product measures, Fubini's and Trol's Theorem.□

Couse ID: 2201011713 **Description:** Advanced Complex Analysis

Full Course Description: 2201011713 Advanced Complex Analysis: 3 C.H. (3+0)□
Theory of analytic functions, analytic functions as mappings, Mobius transformations, conformal mapping, complex integration, zeros of analytic functions, Cauchy's theorem and integral formula, the open mapping theorem, evaluation of real definite and improper integrals, singularities, the argument principle, residue theory, maximum principle, Riemann mapping theorem, Schwartz reflection principle, harmonic functions, the Mean-value property, the Dirichlet problem, Poisson's formula.□

Couse ID: 2201011714 **Description:** Functional Analysis

Full Course Description: 2201011714 Functional Analysis : 3 C.H (3+0)□
Open mapping theorem, closed graph theorem, uniform, Hahn Banach theorem, imbedding and reflexivity of normed spaces, weak and weak *-convergence, Hilbert spaces, orthogonal complements and projections theorem, orthonormal sets and Fourier analysis, Riesz-Frechet theorem, Hilbert adjoint operators, unitary and orthogonal projectional operators, the spectrum and the spectral properties of bounded linear operators, spectral theory, Banach Fixed point theorem.□

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Couse ID: 2201011721 **Description:** Advanced Mathematical Statistics

Full Course Description: 2201011721 Advanced Mathematical Statistics: 3 C.H (3+0)□
Sufficiency and related theorems, completeness, Rao-Blackwell theorem, Cramer-Rao inequality, UMVU estimators, ML, LS, Bayesian, and minimax estimation methods, confidence intervals, Testing hypothesis, Neyman-Pearson Lemma, Randomized test, most powerful tests and uniformly most powerful tests, LR test, sequential tests, unbiased tests.□

Couse ID: 2201011722 **Description:** Probability Theory

Full Course Description: 2201011722 Probability Theory : 3 C.H (3+0)□
Kolmogorov's axioms, random variables, distributions and their functions, Truncated distributions, expectations, Chebyshev's inequality, independence, Borel-Cantelli Lemma, convergence concepts, characteristic functions, central limit theorem, strong and weak laws of large numbers.□

Couse ID: 2201011724 **Description:** Design of Experiments

Full Course Description: 2201011724 Design of Experiments : 3 C.H (3+0), prerequisite (2201011721)□
One-way and two-way classification, fixed effect, random effect and mixed models completely randomized and complete block designs, Latin squares and Greco-Latin squares, factorial experiments, confounding, split plots, incomplete blocks construction and existence, response surfaces, analysis of covariance. □

Couse ID: 2201011741 **Description:** Advanced Abstract Algebra (1)

Full Course Description: 2201011741 Advanced Abstract Algebra (1): 3 C.H (3+0)□
Groups, subgroups, homomorphisms, cyclic groups, co sets, normality, quotient groups, symmetric groups, alternating groups, dihedral Groups, dirct Product and direct sums, free Abelian groups, finitely generated Abelian groups, the action of a group on a set, Sylowtheorem, rings, ring homomorphisms, Ideals, Factorization in commutative rings, rings of quotients, rings of polynomials.□

Couse ID: 2201011742 **Description:** Advanced Abstract Algebra (2)

Full Course Description: 2201011742 Advanced Abstract Algebra (2): 3 C.H (3+0)◌ prerequisite (2201011741)□
Fields, extensions, degree of extensions, algebraic closure, separable extensions, normal extensions, normal closure, splitting fields, the fundamental theorem of Galois theory, Galois Group of a polynomial, finite fields.□

Couse ID: 2201011743 **Description:** Matrix Analysis

Full Course Description: 2201011743 Matrix Analysis: 3 C.H (3+0)□
Eigenvalue, eigenvectors and similarity of matrices, Jordan canonical form, the Ger?gorin theorem, Shur's theorem and Shur's inequality, diagonalization and special classes of matrices, hermitian, normal, unitary, positive semi definite and positive definite, unitary equivalence, singular value decomposition and polar decomposition, generalized inverses, matrix norms, L?wner partial order and matrix inequalities. □

Couse ID: 2201011761 **Description:** Advanced Topology (1)

Full Course Description: 2201011761 Advanced Topology (1): 3 C.H (3+0)□
Product topology, convergence of sequences, more on separation axioms, Jone's lemma, Uryson's lemma, Tietze theorem, compact spaces, countably compact spaces, sequentially compact spaces, locally compact spaces,paracompact spaces, metrizable spaces, products of metrizable spaces.□

Courses Description

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Department: Mathematics

Couse ID: 2201011762	Description: Advanced Topology (2)
Full Course Description: 2201011762 AdvancedTopology (2) : 3 C.H (3+0), prerequisite (2201011761)□ Compactification, the Stone-?ech compactification,metrizability, Urysohn’smetization theorem, Stone theorem, Alexandroff-Urysohnmetrization theorem, Nagata-Smirnov metrization theorem, uniform spaces, uniformizability.□	
Couse ID: 2201011763	Description: Algebraic Topology
Full Course Description: 2201011763 Algebraic Topology: 3 C.H (3+0)□ The homotopy relation, the fundamental group, the fundamental group of the circle, contractible spaces, manifolds, special Euler function, Brouwer fixed point theorem, the fundamental group of the surfaces.□	
Couse ID: 2201011795	Description: Special Topics
Full Course Description: 2201011795 Special Topics: 3 C.H (3+0)□ Topics to be chosen from various fields of Mathematics.□	
Couse ID: 2201011799	Description: Thesis
Full Course Description:	
Couse ID: 2201013799	Description: Thesis
Full Course Description:	
Couse ID: 2201016799	Description: Thesis
Full Course Description:	
Couse ID: 2201019799	Description: Thesis
Full Course Description:	