NPTEL : Elementary Numerical Analysis (Mathematics)

Co-ordinators : Prof. Rekha P. Kulkarni

NPTEL : Measure and Integration (Mathematics)

Co-ordinators : Prof. Inder K Rana

NPTEL : Mathematics in India - From Vedic Period to Modern Times (Mathematics)

Co-ordinators : Prof. M.D. Srinivas, Prof. K. Ramasubramanian, Prof. M.S. Sriram

NPTEL : NOC:Measure Theory (Mathematics)

Co-ordinators : Prof. Inder K Rana

NPTEL : NOC:Calculus for Economics, Commerce and Management (Mathematics)

Co-ordinators : Prof.Inder Kumar Rana

NPTEL : NOC:Basic Linear Algebra (Mathematics)

Co-ordinators : Prof.Inder Kumar Rana

NPTEL : NOC:Commutative Algebra (Mathematics)

Co-ordinators : Prof. Dilip P. Patil

NPTEL : NOC:Galois Theory (Mathematics)

Co-ordinators : Prof. Dilip P. Patil

NPTEL : NOC:Basic Real Analysis (Mathematics)

Co-ordinators : Prof. I. K. Rana

NPTEL : NOC:A Basic Course in Number Theory (Mathematics)

Co-ordinators : Prof. Shripad Garge

NPTEL : NOC:Introduction to Algebraic Topology - Part I (Mathematics)

Co-ordinators : Prof. Anant R. Shastri

NPTEL : NOC:Introduction to Algebraic Topology - Part II (Mathematics)

Co-ordinators : Prof. Anant R. Shastri

NPTEL : NOC:Partial Differential Equations (Mathematics)

Co-ordinators : Prof. Sivaji Ganesh

NPTEL : NOC:An Introduction to Point-Set-Topology - Part I (Mathematics)

Co-ordinators : Prof. Anant R Shastri

NPTEL : NOC:An Introduction to Point-Set-Topology - Part II (Mathematics)

Co-ordinators : Prof. Anant R Shastri

NPTEL : NOC:Fourier Analysis and its Applications (Mathematics)

Co-ordinators : Prof. G. K Srinivasan

NPTEL : NOC:Numerical Analysis (2023) (Mathematics)

Co-ordinators : Prof. S. Baskar

NPTEL : NOC:Point Set Topology (Mathematics)

Co-ordinators : Prof. Ronnie Sebastian

NPTEL : Stochastic Processes (Mathematics)

Co-ordinators : Dr. S. Dharmaraja

NPTEL : NOC:Stochastic Processes - 1 (Mathematics)

Co-ordinators : Dr. S. Dharmaraja

NPTEL : NOC:Stochastic Processes (Mathematics)

Co-ordinators : Dr. S. Dharmaraja

NPTEL : NOC:Chaotic Dynamical Systems (Mathematics)

Co-ordinators : Dr. Anima Nagar

NPTEL : NOC:Introduction to Probability Theory and Stochastic Processes (Mathematics)

Co-ordinators : Dr. S. Dharmaraja

NPTEL : NOC:Statistical Inference (Mathematics)

Co-ordinators : Prof. Nilladri Chaterjee

NPTEL : NOC:Integral Transforms and their Applications (Mathematics)

Co-ordinators : Prof. Sarthok Sircar

Lecture 1 - Introduction to Fourier Transforms - Part 1

Lecture 2 - Introduction to Fourier Transforms - Part 2

Lecture 3 - Introduction to Fourier Transforms - Part 3

Lecture 4 - Properties of Fourier transforms, Shannon Sampling Theorem, Gibb's Phenomena - Part 1

Lecture 5 - Properties of Fourier transforms, Shannon Sampling Theorem, Gibb's Phenomena - Part 2

Lecture 6 - Properties of Fourier transforms, Shannon Sampling Theorem, Gibb's Phenomena - Part 3

Lecture 7 - Applications of Fourier Transforms - Part 1

Lecture 8 - Applications of Fourier Transforms - Part 2

Lecture 9 - Applications of Fourier Transforms - Part 3

Lecture 10 - Introduction to Laplace Transforms - Part 1

Lecture 11 - Introduction to Laplace Transforms - Part 2

Lecture 12 - Introduction to Laplace Transforms - Part 3

Lecture 13 - Inverse Laplace Transform, Initial and Final Value Theorems - Part 1

Lecture 14 - Inverse Laplace Transform, Initial and Final Value Theorems - Part 2

Lecture 15 - Inverse Laplace Transform, Initial and Final Value Theorems - Part 3

Lecture 16 - Applications of Laplace Transforms - Part 1

Lecture 17 - Applications of Laplace Transforms - Part 2

Lecture 18 - Applications of Laplace Transforms - Part 3

Lecture 19 - Applications of Laplace Transforms (Continued) - Part 1

Lecture 20 - Applications of Laplace Transforms (Continued) - Part 2

Lecture 21 - Applications of Laplace Transforms (Continued) - Part 3

Lecture 22 - Applications of Fourier-Laplace Transforms - Part 1

Lecture 23 - Applications of Fourier-Laplace Transforms - Part 2

Lecture 24 - Applications of Fourier-Laplace Transforms - Part 3

Lecture 25 - Introduction to Hankel Transforms - Part 1

Lecture 26 - Introduction to Hankel Transforms - Part 2

Lecture 27 - Introduction to Hankel Transforms - Part 3

Lecture 28 - Introduction to Mellin Transforms - Part 1

Lecture 29 - Introduction to Mellin Transforms - Part 2

Lecture 30 - Introduction to Mellin Transforms - Part 3

Lecture 31 - Introduction to Hilbert Transforms - Part 1

Lecture 65 - Fractional ODEs and PDEs (Continued) - Part 2

Lecture 66 - Fractional ODEs and PDEs (Continued) - Part 3

Lecture 67 - Introduction to Wavelet Transform - Part 1

Lecture 68 - Introduction to Wavelet Transform - Part 2

Lecture 69 - Introduction to Wavelet Transform - Part 3

Lecture 70 - Discrete Haar, Shanon and Debauchies Wavelet - Part 1

Lecture 71 - Discrete Haar, Shanon and Debauchies Wavelet - Part 2

Lecture 72 - Discrete Haar, Shanon and Debauchies Wavelet - Part 3

NPTEL : NOC:Introduction to Fuzzy Set Theory, Arithmetic and Logic (Mathematics)

Co-ordinators : Prof. Nilladri Chaterjee

NPTEL : NOC:Introduction to Methods of Applied Mathematics (Mathematics)

Co-ordinators : Prof. Vivek Kumar Aggarwal

Lecture 32 - Wavelet Transform and Shannon Wavelet

NPTEL : NOC:Advanced Probability Theory (Mathematics)

Co-ordinators : Prof. Niladri Chatterjee

NPTEL : NOC:Scientific Computing using Matlab (Mathematics)

Co-ordinators : Prof. Vivek Kumar Aggarwal, Prof. Mani Mehra

Lecture 65 - Advantage of Implicit and Explicit Methods Over Each other via Matlab/Octave Codes for Initial value Problem

NPTEL : NOC:Non-parametric Statistical Inference (Mathematics)

Co-ordinators : Prof. Niladri Chatterjee

NPTEL : NOC:Matrix Computation and its applications (Mathematics)

Co-ordinators : Prof. Vivek K. Aggarwal

NPTEL : NOC:Introduction to Probability Theory and Statistics (Mathematics)

Co-ordinators : Prof. S Dharmaraja

NPTEL : Formal Languages and Automata Theory (Mathematics)

Co-ordinators : Dr. K.V. Krishna, Dr. Diganta Goswami

Lecture 1 - Introduction

Lecture 2 - Alphabet, Strings, Languages

Lecture 3 - Finite Representation

Lecture 4 - Grammars (CFG)

Lecture 5 - Derivation Trees

Lecture 6 - Regular Grammars

Lecture 7 - Finite Automata

Lecture 8 - Nondeterministic Finite Automata

Lecture 9 - NFA <=> DFA

Lecture 10 - Myhill-Nerode Theorem

Lecture 11 - Minimization

Lecture 12 - RE => FA

Lecture 13 - FA => RE

Lecture 14 - FA <=> RG

Lecture 15 - Variants of FA

Lecture 16 - Closure Properties of RL

Lecture 17 - Homomorphism

Lecture 18 - Pumping Lemma

Lecture 19 - Simplification of CFG

Lecture 20 - Normal Forms of CFG

Lecture 21 - Properties of CFLs

Lecture 22 - Pushdown Automata

Lecture 23 - PDA <=> CFG

Lecture 24 - Turing Machines

Lecture 25 - Turing Computable Functions

Lecture 26 - Combining Turing Machines

Lecture 27 - Multi Input

Lecture 28 - Turing Decidable Languages

Lecture 29 - Varients of Turing Machines

Lecture 30 - Structured Grammars

Lecture 31 - Decidability

NPTEL : Complex Analysis (Mathematics)

Co-ordinators : Prof. P.A.S. Sree Krishna

NPTEL : NOC:Mathematical Finance (Mathematics)

Co-ordinators : Prof. Siddhartha Pratim Chakrabarty

NPTEL : NOC:Mathematical Portfolio Theory (Mathematics)

Co-ordinators : Prof. Siddhartha Pratim Chakrabarty

NPTEL : NOC:Discrete-time Markov Chains and Poission Processes (Mathematics)

Co-ordinators : Prof. Ayon Ganguly, Prof. Subhamay Saha

NPTEL : NOC:Introduction to Queueing Theory (Mathematics)

Co-ordinators : Prof. N. Selvaraju

NPTEL : Applied Multivariate Analysis (Mathematics)

Co-ordinators : Dr. Sharmishtha Mitra

NPTEL : Calculus of Variations and Integral Equations (Mathematics)

Co-ordinators : Dr. Malay Banerjee, Prof. D. Bahuguna

NPTEL : Linear programming and Extensions (Mathematics)

Co-ordinators : Prof. Prabha Sharma

Lecture 32 - Min-cost-flow Sensitivity analysis Shortest path problem sensitivity analysis

Lecture 33 - Min-cost flow changes in arc capacities , Max-flow problem, assignment 7

Lecture 34 - Problem 3 (assignment 7), Min-cut Max-flow theorem, Labelling algorithm

Lecture 35 - Max-flow - Critical capacity of an arc, starting solution for min-cost flow problem

Lecture 36 - Improved Max-flow algorithm

Lecture 37 - Critical Path Method (CPM)

Lecture 38 - Programme Evaluation and Review Technique (PERT)

Lecture 39 - Simplex Algorithm is not polynomial time- An example

Lecture 40 - Interior Point Methods

NPTEL : Convex Optimization (Mathematics)

Co-ordinators : Dr. Joydeep Dutta

Lecture 1 - Convex Optimization

Lecture 2 - Convex Optimization

Lecture 3 - Convex Optimization

Lecture 4 - Convex Optimization

Lecture 5 - Convex Optimization

Lecture 6 - Convex Optimization

Lecture 7 - Convex Optimization

Lecture 8 - Convex Optimization

Lecture 9 - Convex Optimization

Lecture 10 - Convex Optimization

Lecture 11 - Convex Optimization

Lecture 12 - Convex Optimization

Lecture 13 - Convex Optimization

Lecture 14 - Convex Optimization

Lecture 15 - Convex Optimization

Lecture 16 - Convex Optimization

Lecture 17 - Convex Optimization

Lecture 18 - Convex Optimization

Lecture 19 - Convex Optimization

Lecture 20 - Convex Optimization

Lecture 21 - Convex Optimization

Lecture 22 - Convex Optimization

Lecture 23 - Convex Optimization

Lecture 24 - Convex Optimization

Lecture 25 - Convex Optimization

Lecture 26 - Convex Optimization

Lecture 27 - Convex Optimization

Lecture 28 - Convex Optimization

Lecture 29 - Convex Optimization

Lecture 30 - Convex Optimization

Lecture 31 - Convex Optimization

NPTEL : Foundations of Optimization (Mathematics)

Co-ordinators : Dr. Joydeep Dutta

NPTEL : Probability Theory and Applications (Mathematics)

Co-ordinators : Prof. Prabha Sharma

NPTEL : NOC:Basic Calculus for Engineers, Scientists and Economists (Mathematics)

Co-ordinators : Dr. Joydeep Dutta

NPTEL : NOC:Probability and Stochastics for finance (Mathematics)

Co-ordinators : Dr. Joydeep Dutta

NPTEL : NOC:Differential Calculus in Several Variables (Mathematics)

Co-ordinators : Prof. Sudipta Dutta

NPTEL : NOC:Curves and Surfaces (Mathematics)

Co-ordinators : Prof. Sudipta Dutta

NPTEL : NOC:Linear Regression Analysis and Forecasting (Mathematics)

Co-ordinators : Prof. Shalabh

NPTEL : NOC:Introduction to R Software (Mathematics)

Co-ordinators : Prof. Shalabh

NPTEL : NOC:Descriptive Statistics with R Software (Mathematics)

Co-ordinators : Prof. Shalabh

NPTEL : NOC:Calculus of Several Real Variables (Mathematics)

Co-ordinators : Dr. Joydeep Dutta

NPTEL : NOC:Linear Algebra (Prof. A.K. Lal) (Mathematics)

Co-ordinators : Prof. A.K. Lal

NPTEL : NOC:Computational Number Theory and Algebra (Mathematics)

Co-ordinators : Prof. Nitin Saxena

NPTEL : NOC:Basic Calculus 1 and 2 (Mathematics)

Co-ordinators : Prof. Parasar Mohanty

NPTEL : NOC:Advanced Partial Differential Equations (Mathematics)

Co-ordinators : Prof. Kaushik Bal

NPTEL : NOC:Essentials of Data Science With R Software 1: Probability and Statistical Inference (Mathematics)

Co-ordinators : Prof. Shalabh

NPTEL : NOC:Essentials of Data Science With R Software 2: Sampling Theory and Linear Regression Analysis (Mathematics)

Co-ordinators : Prof. Shalabh

NPTEL : NOC:Measure Theoretic Probability 1 (Mathematics)

Co-ordinators : Prof. Suprio Bhar

NPTEL : NOC:Foundations of R Software (Mathematics)

Co-ordinators : Prof. Shalabh

NPTEL : NOC:Foundations of R Software (In Hindi) (Mathematics)

Co-ordinators : Prof. Shalabh

NPTEL : NOC:An Introduction to Hyperbolic Geometry (Mathematics)

Co-ordinators : Prof. Abhijit Pal

NPTEL : NOC:A Primer to Mathematical Optimization (Mathematics)

Co-ordinators : Prof. Debdas Ghosh

NPTEL : NOC:Measure Theoretic Probability 2 (Mathematics)

Co-ordinators : Prof. Suprio Bhar

NPTEL : Advanced Engineering Mathematics (Mathematics)

Co-ordinators : Dr. P. Panigrahi, Prof. J. Kumar, Prof. P.D. Srivastava, Prof. Somesh Kumar

NPTEL : Functional Analysis (Mathematics)

Co-ordinators : Prof. P.D. Srivastava

NPTEL : Numerical methods of Ordinary and Partial Differential Equations (Mathematics)

Co-ordinators : Dr. G.P. Raja Sekhar

NPTEL : Optimization (Mathematics)

Co-ordinators : Prof. A. Goswami, Dr. Debjani Chakraborty

NPTEL : Probability and Statistics (Mathematics)

Co-ordinators : Prof. Somesh Kumar

NPTEL : Regression Analysis (Mathematics)

Co-ordinators : Dr. Soumen Maity

NPTEL : Statistical Inference (Mathematics)

Co-ordinators : Prof. Somesh Kumar

NPTEL : A Basic Course in Real Analysis (Mathematics)

Co-ordinators : Prof. P.D. Srivastava

NPTEL : Statistical Methods for Scientists and Engineers (Mathematics)

Co-ordinators : Prof. Somesh Kumar

NPTEL : NOC:Probability and Statistics (Mathematics)

Co-ordinators : Prof. Somesh Kumar

NPTEL : NOC:Applied Multivariate Statistical Modeling (Mathematics)

Co-ordinators : Dr J Maiti

NPTEL : NOC:Partial Differential Equations (PDE) for Engineers - Solution by Separation of Variables (Mathematics)

Co-ordinators : Prof. S. De

NPTEL : NOC:Introductory Course in Real Analysis (Mathematics)

Co-ordinators : Prof. P.D. Srivastava

NPTEL : NOC:Modeling Transport Phenomena of Microparticles (Mathematics)

Co-ordinators : Dr. G.P. Raja Sekhar, Prof. Somnath Bhattacharyya

NPTEL : NOC:Constrained and Unconstrained Optimization (Mathematics)

Co-ordinators : Dr. Debjani Chakraborty, Prof. A. Goswami

NPTEL : NOC:Matrix Solver (Mathematics)

Co-ordinators : Prof. Somnath Roy

NPTEL : NOC:Introduction to Abstract and Linear Algebra (Mathematics)

Co-ordinators : Prof.Sourav Mukhopadhyay

NPTEL : NOC:Engineering Mathematics-I (Mathematics)

Co-ordinators : Prof. Jitendra Kumar

NPTEL : NOC:Integral and Vector Calculus (Mathematics)

Co-ordinators : Prof. Hari Shankar Mahato

NPTEL : NOC:Transform Calculus and its applications in Differential Equations (Mathematics)

Co-ordinators : Prof. A. Goswami

NPTEL : NOC:Statistical Inference (2019) (Mathematics)

Co-ordinators : Prof. Somesh Kumar

Lecture 32 - Testing of Hypotheses : Basic Concepts - II

Lecture 33 - Neyman Pearson Fundamental Lemma - I

Lecture 34 - Neyman Pearson Fundamental Lemma - II

Lecture 35 - Application of NP-Lemma - I

Lecture 36 - Application of NP-Lemma - II

Lecture 37 - UMP Tests - I

Lecture 38 - UMP Tests - II

Lecture 39 - UMP Tests - III

Lecture 40 - UMP Tests - IV

Lecture 41 - UMP Unbiased Tests - I

Lecture 42 - UMP Unbiased Tests - II

Lecture 43 - UMP Unbiased Tests - III

Lecture 44 - UMP Unbiased Tests - IV

Lecture 45 - Applications of UMP Unbiased Tests - I

Lecture 46 - Applications of UMP Unbiased Tests - II

Lecture 47 - Unbiased Test for Normal Populations - I

Lecture 48 - Unbiased Test for Normal Populations - II

Lecture 49 - Unbiased Test for Normal Populations - III

Lecture 50 - Unbiased Test for Normal Populations - IV

Lecture 51 - Likelihood Ratio Tests - I

Lecture 52 - Likelihood Ratio Tests - II

Lecture 53 - Likelihood Ratio Tests - III

Lecture 54 - Likelihood Ratio Tests - IV

Lecture 55 - Likelihood Ratio Tests - V

Lecture 56 - Likelihood Ratio Tests - VI

Lecture 57 - Likelihood Ratio Tests - VII

Lecture 58 - Likelihood Ratio Tests - VIII

Lecture 59 - Test for Goodness of Fit - I

Lecture 60 - Test for Goodness of Fit - II

Lecture 61 - Interval Estimation - I

Lecture 62 - Interval Estimation - II

Lecture 63 - Interval Estimation - III

Lecture 64 - Interval Estimation - IV

NPTEL : NOC:Mathematical Methods for Boundary Value Problems (Mathematics)

Co-ordinators : Prof. Somnath Bhattacharyya

NPTEL : NOC:Engineering Mathematics-II (Mathematics)

Co-ordinators : Prof. Jitendra Kumar

NPTEL : NOC:Advanced Calculus For Engineers (Mathematics)

Co-ordinators : Prof. Somesh Kumar, Prof. Jitendra Kumar

NPTEL : NOC:Rings and Modules (Mathematics)

Co-ordinators : Prof. Ramakrishna Nanduri, Prof. Mousumi Mandal

NPTEL : NOC:Advanced Computational Techniques (Mathematics)

Co-ordinators : Prof. Somnath Bhattacharyya

NPTEL : NOC:Applied Linear Algebra in AI and ML (Mathematics)

Co-ordinators : Prof. Swanand Khare

NPTEL : NOC:Advanced Engineering Mathematics (2023) (Mathematics)

Co-ordinators : Prof. H S Mahato

NPTEL : NOC:Essentials of Topology (Mathematics)

Co-ordinators : Prof. S. P. Tiwari

NPTEL : An Introduction to Riemann Surfaces and Algebraic Curves: Complex 1-Tori and Elliptic Curves (Mathematics)

Co-ordinators : Dr. T.E. Venkata Balaji

Lecture 31 - The Uniqueness Property of the Weierstrass Phe-function associated to a Lattice in the Plane

Lecture 32 - The First Order Degree Two Cubic Ordinary Differential Equation satisfied by the Weierstrass Phe-function

Lecture 33 - The Values of the Weierstrass Phe-function at the Zeros of its Derivative are nonvanishing Analytic Functions on the Upper Half-Plane

Lecture 34 - The Construction of a Modular Form of Weight Two on the Upper Half-Plane

Lecture 35 - The Fundamental Functional Equations satisfied by the Modular Form of Weight Two on the Upper Half-Plane

Lecture 36 - The Weight Two Modular Form assumes Real Values on the Imaginary Axis in the Upper Half-plane

Lecture 37 - The Weight Two Modular Form Vanishes at Infinity

Lecture 38 - The Weight Two Modular Form Decays Exponentially in a Neighbourhood of Infinity

Lecture 39 - A Suitable Restriction of the Weight Two Modular Form is a Holomorphic Conformal Isomorphism onto the Upper Half-Plane

Lecture 40 - The J-Invariant of a Complex Torus (or) of an Algebraic Elliptic Curve

Lecture 41 - A Fundamental Region in the Upper Half-Plane for the Elliptic Modular J-Invariant

Lecture 42 - The Fundamental Region in the Upper Half-Plane for the Unimodular Group

Lecture 43 - A Region in the Upper Half-Plane Meeting Each Unimodular Orbit Exactly Once

Lecture 44 - Moduli of Elliptic Curves

Lecture 45 - Punctured Complex Tori are Elliptic Algebraic Affine Plane Cubic Curves in Complex 2-Space

Lecture 46 - The Natural Riemann Surface Structure on an Algebraic Affine Nonsingular Plane Curve

Lecture 47 - Complex Projective 2-Space as a Compact Complex Manifold of Dimension Two

Lecture 48 - Complex Tori are the same as Elliptic Algebraic Projective Curves

NPTEL : Linear Algebra (Mathematics)

Co-ordinators : Dr. K.C. Sivakumar

NPTEL : Mathematical Logic (Mathematics)

Co-ordinators : Prof. Arindama Singh

NPTEL : Real Analysis (Mathematics)

Co-ordinators : Prof. S.H. Kulkarni

NPTEL : Dynamic Data Assimilation: An Introduction (Mathematics)

Co-ordinators : Prof. S. Lakshmivarahan

NPTEL : NOC:An Invitation to Mathematics (Mathematics)

Co-ordinators : Prof. Sankaran Vishwanath

NPTEL : Advanced Complex Analysis (Mathematics)

Co-ordinators : Dr. T.E. Venkata Balaji

NPTEL : NOC:Discrete Mathematics (Mathematics)

Co-ordinators : Prof. Sourav Chakraborty

NPTEL : Advanced Complex Analysis - Part 2 (Mathematics)

Co-ordinators : Dr. T.E. Venkata Balaji

NPTEL : Basic Algebraic Geometry : Varieties, Morphisms, Local Rings, Function Fields and Nonsingularity (Mathematics)

Co-ordinators : Dr. T.E. Venkata Balaji

NPTEL : NOC:Introduction to Commutative Algebra (Mathematics)

Co-ordinators : Prof. A.V.Jayanthan

NPTEL : NOC:Differential Equations (Mathematics)

Co-ordinators : Prof. Srinivasa Manam

NPTEL : NOC:Numerical Analysis (Mathematics)

Co-ordinators : Prof. R. Usha

NPTEL : NOC:Graph Theory (Mathematics)

Co-ordinators : Dr. Soumen Maity

NPTEL : NOC:Transform Techniques for Engineers (Mathematics)

Co-ordinators : Prof. Srinivasa Manam

NPTEL : NOC:Introduction to Probability and Statistics (Mathematics)

Co-ordinators : Prof. G. Srinivasan

NPTEL : NOC:Introduction to Abstract Group Theory (Mathematics)

Co-ordinators : Prof. Krishna Hanumanthu

NPTEL : NOC:Groups: Motion, Symmetry and Puzzles (Mathematics)

Co-ordinators : Prof. Amit Kulshrestha

NPTEL : NOC:Introduction to Rings and Fields (Mathematics)

Co-ordinators : Prof. Krishna Hanumanthu

NPTEL : NOC:Probabilistic Methods in PDE (Mathematics)

Co-ordinators : Prof. Anindya Goswami

NPTEL : NOC:Linear Algebra (Prof. Pranav Haridas) (Mathematics)

Co-ordinators : Prof. Pranav Haridas

NPTEL : NOC:Algebra - I (Mathematics)

Co-ordinators : Prof. Amritanshu Prasad, Prof. S. Viswanath

NPTEL : NOC:Computational Commutative Algebra (Mathematics)

Co-ordinators : Prof. Manoj Kummini

NPTEL : NOC:Laplace Transform (Mathematics)

Co-ordinators : Prof. Indrava Roy

NPTEL : NOC:Measure Theory (Prof. Indrava Roy) (Mathematics)

Co-ordinators : Prof. Indrava Roy

NPTEL : NOC:Complex Analysis (Mathematics)

Co-ordinators : Prof. Pranav Haridas

NPTEL : NOC:Real Analysis - I (Mathematics)

Co-ordinators : Prof. Jaikrishnan J

NPTEL : NOC:Variational Calculus and its applications in Control Theory and Nanomechanics (Mathematics)

Co-ordinators : Prof. Sarthok Sircar

Lecture 32 - Broken extremals / Hamiltonian Formulation - Part 2

Lecture 33 - Broken extremals / Hamiltonian Formulation - Part 3

Lecture 34 - Broken extremals / Hamiltonian Formulation - Part 4

Lecture 35 - Broken extremals / Hamiltonian Formulation - Part 5

Lecture 36 - Broken extremals / Hamiltonian Formulation - Part 6

Lecture 37 - Hamilton-Jacobi Equations - Part 1

Lecture 38 - Hamilton-Jacobi Equations - Part 2

Lecture 39 - Hamilton-Jacobi Equations - Part 3

Lecture 40 - Hamilton-Jacobi Equations - Part 4

Lecture 41 - Hamilton-Jacobi Equations - Part 5

Lecture 42 - Hamilton-Jacobi Equations - Part 6

Lecture 43 - Noether's Theorem / Introduction to Second Variation - Part 1

Lecture 44 - Noether's Theorem / Introduction to Second Variation - Part 2

Lecture 45 - Noether's Theorem / Introduction to Second Variation - Part 3

Lecture 46 - Noether's Theorem / Introduction to Second Variation - Part 4

Lecture 47 - Noether's Theorem / Introduction to Second Variation - Part 5

Lecture 48 - Noether's Theorem / Introduction to Second Variation - Part 6

Lecture 49 - Conjugate points / Jacobi Accessory Equations / Introduction to Optimal Control Theory - Part 1

Lecture 50 - Conjugate points / Jacobi Accessory Equations / Introduction to Optimal Control Theory - Part 2

Lecture 51 - Conjugate points / Jacobi Accessory Equations / Introduction to Optimal Control Theory - Part 3

Lecture 52 - Conjugate points / Jacobi Accessory Equations / Introduction to Optimal Control Theory - Part 4

Lecture 53 - Conjugate points / Jacobi Accessory Equations / Introduction to Optimal Control Theory - Part 5

Lecture 54 - Conjugate points / Jacobi Accessory Equations / Introduction to Optimal Control Theory - Part 6

Lecture 55 - Constrained Optimization in Optimal Control Theory - Part 1

Lecture 56 - Constrained Optimization in Optimal Control Theory - Part 2

Lecture 57 - Constrained Optimization in Optimal Control Theory - Part 3

Lecture 58 - Constrained Optimization in Optimal Control Theory - Part 4

Lecture 59 - Constrained Optimization in Optimal Control Theory - Part 5

Lecture 60 - Constrained Optimization in Optimal Control Theory - Part 6

Lecture 61 - Introduction to Nanomechanics - Part 1

Lecture 62 - Introduction to Nanomechanics - Part 2

Lecture 63 - Introduction to Nanomechanics - Part 3

Lecture 64 - Introduction to Nanomechanics - Part 4

NPTEL : NOC:Introduction to Galois Theory (Mathematics)

Co-ordinators : Prof. Krishna Hanumanthu

NPTEL : NOC:Basic Calculus 1 (Mathematics)

Co-ordinators : Prof. Arindama Singh

NPTEL : NOC:Functional Analysis (Mathematics)

Co-ordinators : Prof. Kesavan

Lecture 1 - Normed Linear Spaces

Lecture 2 - Examples of Normed Linear Spaces

Lecture 3 - Examples (Continued...)

Lecture 4 - Continuous linear maps - Part 1

Lecture 5 - Continuous linear maps - Part 2

Lecture 6 - Isomorphisms

Lecture 7 - Exercises

Lecture 8 - Exercises (Continued...)

Lecture 9 - Hahn-Banach Theorems

Lecture 10 - Reflexivity

Lecture 11 - Geometric version

Lecture 12 - Geometric version (Continued...)

Lecture 13 - Vector valued integration

Lecture 14 - Exercises - Part 1

Lecture 15 - Exercises - Part 2

Lecture 16 - Baire's Theorem and Applications

Lecture 17 - Application to Fourier series

Lecture 18 - Open mapping and closed graph theorems

Lecture 19 - Annihilators

Lecture 20 - Complemented subspaces

Lecture 21 - Unbounded Operators, Adjoints - Part 1

Lecture 22 - Unbounded Operators, Adjoints - Part 2

Lecture 23 - Orthogonality relations

Lecture 24 - Exercises

Lecture 25 - Exercises (Continued...)

Lecture 26 - Weak topology - Part 1

Lecture 27 - Weak topology - Part 2

Lecture 28 - Weak topology - Part 3

Lecture 29 - Weak* topology - Part 1

Lecture 30 - Weak* topology - Part 2

Lecture 31 - Reflexive Spaces

NPTEL : NOC:Mathematical Methods in Physics 1 (Mathematics)

Co-ordinators : Prof. Auditya Sharma

NPTEL : NOC:Computational Mathematics with SageMath (Mathematics)

Co-ordinators : Prof. Ajit Kumar

NPTEL : NOC:Introduction to Probability (with examples using R) (Mathematics)

Co-ordinators : Prof. Siva Athreya

NPTEL : NOC:Algebra-II (Mathematics)

Co-ordinators : Prof. Amritanshu Prasad, Prof. S. Viswanath

NPTEL : NOC:Mathematical Methods in Physics 2 (Mathematics)

Co-ordinators : Prof. Auditya Sharma

NPTEL : NOC:Real Analysis - II (Mathematics)

Co-ordinators : Prof. Jaikrishnan J

NPTEL : NOC:Sobolev Spaces and Partial Differential Equations (Mathematics)

Co-ordinators : Prof. Kesavan

NPTEL : NOC:Combinatorics (Mathematics)

Co-ordinators : Prof. Narayanan N

NPTEL : NOC:Our Mathematical Senses (Mathematics)

Co-ordinators : Prof. Vijay Ravikumar

NPTEL : NOC:Algebraic Combinatorics (Mathematics)

Co-ordinators : Prof. Amritanshu Prasad, Prof. Sankaran Viswanath

Lecture 32 - Finite Automata

Lecture 33 - The Pumping Lemma

Lecture 34 - The Dyck Language

Lecture 35 - Permutations and their cycles

Lecture 36 - Permutation Groups

Lecture 37 - Orbits, fixed points, stabilizers

Lecture 38 - The orbit counting theorem

Lecture 39 - The Polya Enumeration Theorem

Lecture 40 - The Cycle Index Polynomials

Lecture 41 - Cycle Index of the Octahedral Group

Lecture 42 - Cycle Index of the Full Permutation Group

Lecture 43 - Combinatorial Species

Lecture 44 - Generating Series of a Species

Lecture 45 - Cycle Index Series of a Species

Lecture 46 - Isomorphism of Species

Lecture 47 - Visualization of Species

Lecture 48 - Sum of Species

Lecture 49 - Product of Species

Lecture 50 - Sums and Products: More Examples

Lecture 51 - Substitution of Species

Lecture 52 - Derivative of a Species

Lecture 53 - Powers and Seqeunces of Binomial Type

Lecture 54 - Pointing and Cayley's Theorem

Lecture 55 - R-enriched Trees

Lecture 56 - R-enriched Endofunctions

Lecture 57 - Lagrange Inversion Forumla

Lecture 58 - Motivation for the LGV Lemma

Lecture 59 - Statement of the LGV Lemma

Lecture 60 - Nice Applications of the LGV Lemma

Lecture 61 - Sign-Reversing Involutions

Lecture 62 - Proof of the LGV Lemma

Lecture 63 - The Cauchy-Binet Formula

Lecture 64 - Symmetric polynomials: definition and examples

NPTEL : NOC:An Invitation to Topology (Mathematics)

Co-ordinators : Prof. Indrava Roy

NPTEL : NOC:Operator Theory (Mathematics)

Co-ordinators : Prof. G. Ramesh

NPTEL : NOC:Measure and Integration (Mathematics)

Co-ordinators : Prof. S. Kesavan

NPTEL : NOC:Approximate Reasoning using Fuzzy Set Theory (Mathematics)

Co-ordinators : Prof. Balasubramaniam Jayaram

Lecture 1 - Flow of the Course: A not-so-sneak peek

Lecture 2 - Fuzzy Sets - The Necessity

Lecture 3 - Fuzzy Sets - Representations

Lecture 4 - Fuzziness vs Probability

Lecture 5 - Fuzzy Sets - Some Important Notions

Lecture 6 - Operations on Fuzzy Sets

Lecture 7 - Posets on Fuzzy Sets

Lecture 8 - Lattice of Fuzzy Sets

Lecture 9 - Boolean Algebra of Sets

Lecture 10 - Algebras on Fuzzy Sets

Lecture 11 - Triangular Norms

Lecture 12 - Triangular Norms: Analytical Aspects

Lecture 13 - Triangular Norms: Algebraic Aspects

Lecture 14 - T-Norms: Construction and Representations

Lecture 15 - T-Norms:Complementation and Duality

Lecture 16 - Fuzzy Implications

Lecture 17 - Fuzzy Implications - Desirable Properties

Lecture 18 - Construction of Fuzzy Implication - I

Lecture 19 - Construction of Fuzzy Implication - II

Lecture 20 - Construction of Fuzzy Implication - II

Lecture 21 - Construction of Fuzzy Implication - III

Lecture 22 - Construction of Fuzzy Implication - IV

Lecture 23 - (N, T, I)- An Organic Relationship

Lecture 24 - Fuzzy Relations

Lecture 25 - Composition of Fuzzy Relations

Lecture 26 - Similarity and Compatibility Classes

Lecture 27 - On the Transitivity of Fuzzy Relations - I

Lecture 28 - On the Transitivity of Fuzzy Relations - II

Lecture 29 - Fuzzy Propositions: Some Interpretations

Lecture 30 - Fuzzy If-Then Rules

Lecture 31 - Fuzzy Relational Inference

NPTEL : NOC:Probability-II with Examples Using R (Mathematics)

Co-ordinators : Prof. Siva Athreya

NPTEL : NOC:Predictive Analytics - Regression and Classification (Mathematics)

Co-ordinators : Prof. Sourish Das

NPTEL : NOC:Introduction to Algebraic Geometry (Mathematics)

Co-ordinators : Prof. Arijit Dey

NPTEL : Discrete Mathematics (Mathematics)

Co-ordinators : Dr. Aditi Gangopadhyay, Dr. Sugata Gangopadhyay, Dr. Tanuja Srivastava

NPTEL : NOC:Mathematical Methods and its Applications (Mathematics)

Co-ordinators : Prof. P.N. Agarwal, S. K. Gupta

NPTEL : NOC:Integral Equations, Calculus of Variations and its Applications (Mathematics)

Co-ordinators : Prof.D. N Pandey, Prof. P.N. Agarwal

NPTEL : NOC:Nonlinear Programming (Mathematics)

Co-ordinators : S. K. Gupta

NPTEL : NOC:Numerical Methods (Mathematics)

Co-ordinators : Prof. Sanjeev Kumar, Prof. Ameeya Kumar Nayak

NPTEL : NOC:Numerical Linear Algebra (Mathematics)

Co-ordinators : Prof.D. N Pandey, Prof. P.N. Agrawal

NPTEL : NOC:Numerical Methods - Finite Difference Approach (Mathematics)

Co-ordinators : Prof. Ameeya Kumar Nayak

NPTEL : NOC:Multivariable Calculus (Mathematics)

Co-ordinators : Dr. Sanjeev Kumar, S. K. Gupta

NPTEL : NOC:Ordinary and Partial Differential Equations and Applications (Mathematics)

Co-ordinators : Prof.D. N Pandey, Prof. P.N. Agrawal

NPTEL : NOC:Matrix Analysis with Applications (Mathematics)

Co-ordinators : Dr. Sanjeev Kumar, S. K. Gupta

NPTEL : NOC:Mathematical Modelling: Analysis and Applications (Mathematics)

Co-ordinators : Prof. Ameeya Kumar Nayak

NPTEL : NOC:Dynamical System and Control (Mathematics)

Co-ordinators : Prof.D. N Pandey, Dr. N. Sukavanam

Lecture 32 - Introduction to Control Systems - II

Lecture 33 - Controllability of Autonomous Systems

Lecture 34 - Controllability of Non-autonomous Systems

Lecture 35 - Observability - I

Lecture 36 - Observability - II

Lecture 37 - Results on Controllability and Observability

Lecture 38 - Companion Form

Lecture 39 - Feedback Control - I

Lecture 40 - Feedback Control - II

Lecture 41 - Feedback Control - III

Lecture 42 - Feedback Control - IV

Lecture 43 - State Observer

Lecture 44 - Stabilizability

Lecture 45 - Introduction to Discrete Systems - I

Lecture 46 - Introduction to Discrete Systems - II

Lecture 47 - Lyapunov Stability Theory - I

Lecture 48 - Lyapunov Stability Theory - II

Lecture 49 - Lyapunov Stability Theory - III

Lecture 50 - Optimal Control - I

Lecture 51 - Optimal Control - II

Lecture 52 - Optimal Control - III

Lecture 53 - Optimal Control - IV

Lecture 54 - Optimal Control for Discrete Systems - I

Lecture 55 - Optimal Control for Discrete Systems - II

Lecture 56 - Controllability of Discrete Systems

Lecture 57 - Observability of Discrete Systems

Lecture 58 - Stability for Discrete Systems

Lecture 59 - Relation between Continuous and Discrete Systems - I

Lecture 60 - Relation between Continuous and Discrete Systems - II

NPTEL : NOC:Advanced Engineering Mathematics (Mathematics)

Co-ordinators : Prof. P.N. Agarwal

NPTEL : NOC:Higher Engineering Mathematics (Mathematics)

Co-ordinators : Prof. P.N. Agarwal

NPTEL : NOC:Operations Research (Mathematics)

Co-ordinators : Prof. Kusumdeep

NPTEL : NOC:Essential Mathematics for Machine Learning (Mathematics)

Co-ordinators : Prof. S.K. Gupta, Dr. Sanjeev Kumar

NPTEL : NOC:Advanced Linear Algebra (Mathematics)

Co-ordinators : Prof. Premananda Bera

NPTEL : Advanced Matrix Theory and Linear Algebra for Engineers (Mathematics)

Co-ordinators : Prof. Vittal Rao

NPTEL : Ordinary Differential Equations and Applications (Mathematics)

Co-ordinators : Prof. A.K. Nandakumaran, Prof. Raju K. George, Prof. P.S. Datti

NPTEL : NOC:Linear Algebra (Mathematics)

Co-ordinators : Prof. Dilip P. Patil

NPTEL : NOC:An Introduction to Smooth Manifolds (Mathematics)

Co-ordinators : Prof. Harish Seshadri

NPTEL : NOC:Measure Theory (Prof. E. K. Narayanan) (Mathematics)

Co-ordinators : Prof. E. K. Narayanan

Lecture 32 - Lebesgue set which is not Borel

Lecture 33 - L^p spaces

Lecture 34 - L^p norm

Lecture 35 - Completeness of L^p

Lecture 36 - Properties of L^p spaces

Lecture 37 - Examples of L^p spaces

Lecture 38 - Product sigma algebra

Lecture 39 - Product measures - I

Lecture 40 - Product measures - II

Lecture 41 - Fubini's theorem - I

Lecture 42 - Fubini's theorem - II

Lecture 43 - Completeness of product measures

Lecture 44 - Polar coordinates

Lecture 45 - Applications of Fubini's theorem

Lecture 46 - Complex measures - I

Lecture 47 - Complex measures - II

Lecture 48 - Absolutely continuous measures

Lecture 49 - L^2 space

Lecture 50 - Continuous linear functionals

Lecture 51 - Radon-Nikodym theorem - I

Lecture 52 - Radon Nikodym theorem - II

Lecture 53 - Consequences of Radon-Nikodym theorem - I

Lecture 54 - Consequences of Radon-Nikodym theorem - II

Lecture 55 - Continuous linear functionals on L^p spaces - I

Lecture 56 - Continuous linear functionals on L^p spaces - II

Lecture 57 - Riesz representation theorem - I

Lecture 58 - Riesz representation theorem - II

Lecture 59 - Hardy-Littlewood maximal function

Lecture 60 - Lebesgue differentiation theorem

Lecture 61 - Absolutely continuous functions - I

Lecture 62 - Absolutely continuous functions - II

NPTEL : NOC:Introduction to Algebraic Geometry and Commutative Algebra (Mathematics)

Co-ordinators : Prof. Dilip P. Patil

NPTEL : NOC:First Course on Partial Differential Equations-I (Mathematics)

Co-ordinators : Prof. P. S. Datti, Prof. A. K. Nandakumaran

NPTEL : NOC:First Course on Partial Differential Equations - II (Mathematics)

Co-ordinators : Prof. A. K. Nandakumaran

NPTEL : Matrix Theory (Mathematics)

Co-ordinators : Prof. Chandra Murthy

NPTEL : NOC:C* Algebras and Spectral Theorem (Mathematics)

Co-ordinators : Prof. E K Narayanan

NPTEL : NOC:Advanced Partial Differential Equations (Part I: Distributions and Sobolev Spaces) (Mathematics)

Co-ordinators : Prof. P.S. Datti, Prof. A K Nandakumaran