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

Lecture 1 - Real Numbers and Sequences - Part I

Lecture 2 - Real Numbers and Sequences - Part II

Lecture 3 - Real Numbers and Sequences - Part III

Lecture 4 - Convergence of Sequences - Part I

Lecture 5 - Convergence of Sequences - Part II

Lecture 6 - Convergence of Sequences - Part III

Lecture 7 - The LUB Property and Consequences - Part I

Lecture 8 - The LUB Property and Consequences - Part II

Lecture 9 - The LUB Property and Consequences - Part III

Lecture 10 - Topology of Real Numbers: Closed Sets - Part I

Lecture 11 - Topology of Real Numbers: Closed Sets - Part II

Lecture 12 - Topology of Real Numbers: Closed Sets - Part III

Lecture 13 - Topology of Real Numbers: Limit Points, Interior Points, Open Sets and Compact Sets - Part I

Lecture 14 - Topology of Real Numbers: Limit Points, Interior Points, Open Sets and Compact Sets - Part II

Lecture 15 - Topology of Real Numbers: Limit Points, Interior Points, Open Sets and Compact Sets - Part III

Lecture 16 - Topology of Real Numbers: Compact Sets and Connected Sets - Part I

Lecture 17 - Topology of Real Numbers: Compact Sets and Connected Sets - Part II

Lecture 18 - Topology of Real Numbers: Compact Sets and Connected Sets - Part III

Lecture 19 - Topology of Real Numbers: Connected Sets; Limits and Continuity - Part I

Lecture 20 - Topology of Real Numbers: Connected Sets; Limits and Continuity - Part II

Lecture 21 - Topology of Real Numbers: Connected Sets; Limits and Continuity - Part III

Lecture 22 - Continuity and Uniform continuity - Part I

Lecture 23 - Continuity and Uniform continuity - Part II

Lecture 24 - Continuity and Uniform continuity - Part III

Lecture 25 - Uniform continuity and connected sets - Part I

Lecture 26 - Uniform continuity and connected sets - Part II

Lecture 27 - Uniform continuity and connected sets - Part III

Lecture 28 - Connected sets and continuity - Part I

Lecture 29 - Connected sets and continuity - Part II

Lecture 30 - Connected sets and continuity - Part III

Lecture 31 - Differentiability - Part I

Lecture 32 - Differentiability - Part II

Lecture 33 - Differentiability - Part III

Lecture 34 - Differentiability - Part IV

Lecture 35 - Differentiability - Part V

Lecture 36 - Differentiability - Part VI

Lecture 37 - Riemann Integration - Part I

Lecture 38 - Riemann Integration - Part II

Lecture 39 - Riemann Integration - Part III

Lecture 40 - Riemann Integration - Part IV

Lecture 41 - Riemann Integration - Part V

Lecture 42 - Riemann Integration - Part VI

Lecture 43 - Riemann Sum and Riemann Integrals - Part I

Lecture 44 - Riemann Sum and Riemann Integrals - Part II

Lecture 45 - Riemann Sum and Riemann Integrals - Part III

Lecture 46 - Optimization in several variables - Part I

Lecture 47 - Optimization in several variables - Part II

Lecture 48 - Optimization in several variables - Part III

Lecture 49 - Integration in several variables - Part I

Lecture 50 - Integration in several variables - Part II

Lecture 51 - Integration in several variables - Part III

Lecture 52 - Change of variables - Part I

Lecture 53 - Change of variables - Part II

Lecture 54 - Change of variables - Part III

Lecture 55 - Change of variables - Part IV

Lecture 56 - Metric Spaces - Part I

Lecture 57 - Metric Spaces - Part II

Lecture 58 - Metric Spaces - Part III

Lecture 59 - L^p Metrics - Part I

Lecture 60 - L^p Metrics - Part II

Lecture 61 - L^p Metrics - Part III

Lecture 62 - Pointwise and Uniform convergence - Part I

Lecture 63 - Pointwise and Uniform convergence - Part II

Lecture 64 - Pointwise and Uniform convergence - Part III

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

Lecture 1 - Welcome Speech

Lecture 2 - Preliminaries from Banach spaces

Lecture 3 - Differentiation on Banach spaces

Lecture 4 - Preliminaries from one-variable real analysis

Lecture 5 - Implicit and Inverse function theorems

Lecture 6 - Compact Hausdorff spaces

Lecture 7 - Local Compactness

Lecture 8 - Local Compactness (Continued...)

Lecture 9 - The retraction functor k(X)

Lecture 10 - Compactly generated spaces

Lecture 11 - Paracompactness

Lecture 12 - Partition of Unity

Lecture 13 - Paracompactness (Continued...)

Lecture 14 - Paracompactness (Continued...)

Lecture 15 - Various Notions of Compactness

Lecture 16 - Total Boundedness

Lecture 17 - Arzel`a- Ascoli Theorem

Lecture 18 - Generalities on Compactification

Lecture 19 - AlexandroffÃ¢'s compactifiction

Lecture 20 - Proper maps

Lecture 21 - Stone-Cech compactification

Lecture 22 - Stone-WeierstrassÃ¢'s Theorems

Lecture 23 - Real Stone-Weierstrass Theorem

Lecture 24 - Complex and extended Stone-Weierstrass theorem

Lecture 25 - (Missing)

Lecture 26 - UrysohnÃ¢'s Metrization theorem

Lecture 27 - Nagata Smyrnov Metrization theorem

Lecture 28 - Nets

Lecture 29 - Cofinal families subnets

Lecture 30 - Basics of Filters

Lecture 31 - Convergence Properties of Filters

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

Lecture 1 - Statistical Inference - 1

Lecture 2 - Statistical Inference - 2

Lecture 3 - Statistical Inference - 3

Lecture 4 - Statistical Inference - 4

Lecture 5 - Statistical Inference - 5

Lecture 6 - Statistical Inference - 6

Lecture 7 - Statistical Inference - 7

Lecture 8 - Statistical Inference - 8

Lecture 9 - Statistical Inference - 9

Lecture 10 - Statistical Inference - 10

Lecture 11 - Statistical Inference - 11

Lecture 12 - Statistical Inference - 12

Lecture 13 - Statistical Inference - 13

Lecture 14 - Statistical Inference - 14

Lecture 15 - Statistical Inference - 15

Lecture 16 - Stasistical Inference - 16

Lecture 17 - Stasistical Inference - 17

Lecture 18 - Statistical Inference - 18

Lecture 19 - Stasistical Inference - 19

Lecture 20 - Stasistical Inference - 20

Lecture 21 - Stasistical Inference - 21

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

Co-ordinators : Prof. Sarthok Sircar

Lecture 32 - Introduction to Hilbert Transforms - Part 2

Lecture 33 - Introduction to Hilbert Transforms - Part 3

Lecture 34 - Applications of Hilbert Transfroms, Introduction to Stieltjes Transform - Part 1

Lecture 35 - Applications of Hilbert Transfroms, Introduction to Stieltjes Transform - Part 2

Lecture 36 - Applications of Hilbert Transfroms, Introduction to Stieltjes Transform - Part 3

Lecture 37 - Applications of Stieltjes Transform, Generalized Stieltjes Transform - Part 1

Lecture 38 - Applications of Stieltjes Transform, Generalized Stieltjes Transform - Part 2

Lecture 39 - Applications of Stieltjes Transform, Generalized Stieltjes Transform - Part 3

Lecture 40 - Introduction to Legendre Transform - Part 1

Lecture 41 - Introduction to Legendre Transform - Part 2

Lecture 42 - Introduction to Legendre Transform - Part 3

Lecture 43 - Introduction to Z-transform - Part 1

Lecture 44 - Introduction to Z-transform - Part 2

Lecture 45 - Introduction to Z-transform - Part 3

Lecture 46 - Inverse Z-transfrom, Applciations of Z-Transform - Part 1

Lecture 47 - Inverse Z-transfrom, Applciations of Z-Transform - Part 2

Lecture 48 - Inverse Z-transfrom, Applciations of Z-Transform - Part 3

Lecture 49 - Introduction to Radon Transform - Part 1

Lecture 50 - Introduction to Radon Transform - Part 2

Lecture 51 - Introduction to Radon Transform - Part 3

Lecture 52 - Inverse Radon Transform, Applications to Radon Transform - Part 1

Lecture 53 - Inverse Radon Transform, Applications to Radon Transform - Part 2

Lecture 54 - Inverse Radon Transform, Applications to Radon Transform - Part 3

Lecture 55 - Introduction to Fractional Calculus - Part 1

Lecture 56 - Introduction to Fractional Calculus - Part 2

Lecture 57 - Introduction to Fractional Calculus - Part 3

Lecture 58 - Fractional ODEs, Abel's Integral Equations - Part 1

Lecture 59 - Fractional ODEs, Abel's Integral Equations - Part 2

Lecture 60 - Fractional ODEs, Abel's Integral Equations - Part 3

Lecture 61 - Fractional PDEs - Part 1

Lecture 62 - Fractional PDEs - Part 2

Lecture 63 - Fractional PDEs - Part 3

Lecture 64 - Fractional ODEs and PDEs (Continued) - Part 1

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

NPTEL : Convex Optimization (Mathematics)

Co-ordinators : Dr. Joydeep Dutta

Lecture 32 - Convex Optimization

Lecture 33 - Convex Optimization

Lecture 34 - Convex Optimization

Lecture 35 - Convex Optimization

Lecture 36 - Convex Optimization

Lecture 37 - Convex Optimization

Lecture 38 - Convex Optimization

Lecture 39 - Convex Optimization

Lecture 40 - Convex Optimization

Lecture 41 - Convex Optimization

Lecture 42 - 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

Lecture 1 - Real numbers and Archimedean property

Lecture 2 - Supremum and Decimal representation of Reals

Lecture 3 - Functions

Lecture 4 - Functions continued and Limits

Lecture 5 - Limits (Continued...)

Lecture 6 - Limits (Continued...) and Continuity

Lecture 7 - Continuity and Intermediate Value Property

Lecture 8 - Differentiation

Lecture 9 - Chain Rule

Lecture 10 - Nth derivative of a function

Lecture 11 - Local extrema and Rolle's theorem

Lecture 12 - Mean value theorem and Monotone functions

Lecture 13 - Local extremum tests

Lecture 14 - Concavity and points of inflection

Lecture 15 - Asymptotes and plotting graph of functions

Lecture 16 - Optimization and L'Hospital Rule

Lecture 17 - L'Hospital Rule continued and Cauchy Mean value theorem

Lecture 18 - Approximation of Roots

Lecture 19 - Antiderivative and Riemann Integration

Lecture 20 - Riemann's criterion for Integrability

Lecture 21 - Integration and its properties

Lecture 22 - Area and Mean value theorem for integrals

Lecture 23 - Fundamental theorem of Calculus

Lecture 24 - Integration by parts and Trapezoidal rule

Lecture 25 - Simpson's rule and Substitution in integrals

Lecture 26 - Area between curves

Lecture 27 - Arc Length and Parametric curves

Lecture 28 - Polar Co-ordinates

Lecture 29 - Area of curves in polar coordinates

Lecture 30 - Volume of solids

Lecture 31 - Improper Integrals

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

Lecture 32 - Bernoulli and Binomial Distribution

Lecture 33 - Binomial Distribution in R

Lecture 34 - Poisson Distribution

Lecture 35 - Poisson Distribution in R

Lecture 36 - Geometric Distribution

Lecture 37 - Geometric Distribution in R

Lecture 38 - Continuous Random Variables and Uniform Distribution

Lecture 39 - Normal Distribution

Lecture 40 - Normal Distribution in R

Lecture 41 - Normal Distribution - More Results

Lecture 42 - Exponential Distribution

Lecture 43 - Bivariate Probability Distribution for Discrete Random Variables

Lecture 44 - Bivariate Probability Distribution in R Software

Lecture 45 - Bivariate Probability Distribution for Continuous Random Variables

Lecture 46 - Examples in Bivariate Probability Distribution Functions

Lecture 47 - Covariance and Correlation

Lecture 48 - Covariance and Correlation â€ Examples and R Software

Lecture 49 - Bivariate Normal Distribution

Lecture 50 - Chi square Distribution

Lecture 51 - t-Distribution

Lecture 52 - F-Distribution

Lecture 53 - Distribution of Sample Mean, Convergence in Probability and Weak Law of Large Numbers

Lecture 54 - Central Limit Theorem

Lecture 55 - Needs for Drawing Statistical Inferences

Lecture 56 - Unbiased Estimators

Lecture 57 - Efficiency of Estimators

Lecture 58 - CramÃ©râ€“Rao Lower Bound and Efficiency of Estimators

Lecture 59 - Consistency and Sufficiency of Estimators

Lecture 60 - Method of Moments

Lecture 61 - Method of Maximum Likelihood and Rao Blackwell Theorem

Lecture 62 - Basic Concepts of Confidence Interval Estimation

Lecture 63 - Confidence Interval for Mean in One Sample with Known Variance

Lecture 64 - Confidence Interval for Mean and Variance

Lecture 65 - Basics of Tests of Hypothesis and Decision Rules

Lecture 66 - Test Procedures for One Sample Test for Mean with Known Variance

Lecture 67 - One Sample Test for Mean with Unknown Variance

Lecture 68 - Two Sample Test for Mean with Known and Unknown Variances

Lecture 69 - Test of Hypothesis for Variance in One and Two Samples

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 : NOC:Set Theory and Mathematical Logic (Mathematics)

Co-ordinators : Prof. Amit Kuber

Lecture 1 - Introduction to Set Theory

Lecture 2 - Operations on Sets, and Functions

Lecture 3 - Bijective Functions

Lecture 4 - Equivalence Relations and Partitions

Lecture 5 - Cantor-Schroder-Bernstein Theorem

Lecture 6 - Natural Numbers in ZF Set Theory

Lecture 7 - Standard Number Systems in ZF Set Theory

Lecture 8 - (Finitary) Power Sets and Countability

Lecture 9 - Bijections of the set of real numbers: Dedekind cut and Cantor's middle-third set

Lecture 10 - Bijections of the real numbers: Continued Fractions

Lecture 11 - Principles of Mathematical Induction

Lecture 12 - Ordinal Numbers

Lecture 13 - Ordinal Arithmetic

Lecture 14 - Cardinal Numbers and Cardinal Arithmetic

Lecture 15 - Tutorial - Week 4

Lecture 16 - Partial Orders

Lecture 17 - Lattices

Lecture 18 - Equivalents of the Axiom of Choice (AC): Zorn's Lemma (ZL) and Well-ordering theorem (WOT)

Lecture 19 - Tutorial - Week 5

Lecture 20 - Boolean Algebras

Lecture 21 - Stone's Representation Theorems for Boolean Algebras

Lecture 22 - Some Exercises on Boolean Algebras

Lecture 23 - Ultrafilters in Boolean Algebras

Lecture 24 - Introduction to Mathematical Logic

Lecture 25 - Propositional Logic: Language, Formulas and Valuations

Lecture 26 - Propositional Logic: Logical Equivalence and Lindenbaum-Tarski Algebra

Lecture 27 - Tutorial - Week 7

Lecture 28 - Propositional Logic: Normal Forms of Formulas and Adequacy of Connectives

Lecture 29 - Propositional Logic: Semantic Consequence Relation

Lecture 30 - Propositional Logic: Syntactic Consequence Relation

Lecture 31 - Deduction Theorem (Continued...)

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

Lecture 1 - Introduction to Optimization

Lecture 2 - Assumptions and Mathematical Modeling of LPP

Lecture 3 - Geometrey of LPP

Lecture 4 - Graphical Solution of LPP - I

Lecture 5 - Graphical Solution of LPP - II

Lecture 6 - Solution of LPP: Simplex Method

Lecture 7 - Simplex Method

Lecture 8 - Introduction to BIG-M Method

Lecture 9 - Algorithm of BIG-M Method

Lecture 10 - Problems on BIG-M Method

Lecture 11 - Two Phase Method: Introduction

Lecture 12 - Two Phase Method: Problem Solution

Lecture 13 - Special Cases of LPP

Lecture 14 - Degeneracy in LPP

Lecture 15 - Sensitivity Analysis - I

Lecture 16 - Sensitivity Analysis - II

Lecture 17 - Problems on Sensitivity Analysis

Lecture 18 - Introduction to Duality Theory - I

Lecture 19 - Introduction to Duality Theory - II

Lecture 20 - Dual Simplex Method

Lecture 21 - Examples on Dual Simplex Method

Lecture 22 - Interger Linear Programming

Lecture 23 - Interger Linear Programming

Lecture 24 - IPP: Branch and BBound Method

Lecture 25 - Mixed Integer Programming Problem

Lecture 26

Lecture 27

Lecture 28

Lecture 29

Lecture 30

Lecture 31 - Introduction to Nonlinear programming

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

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

Lecture 32 - Improper Integral - Part 2

Lecture 33 - Improper Integral - Part 3

Lecture 34 - Improper Integral - Part 4

Lecture 35 - Beta and Gamma Function - Part 1

Lecture 36 - Beta and Gamma Function - Part 2

Lecture 37 - Differentiation under the Integral Sign

Lecture 38 - Double Integrals - Part 1

Lecture 39 - Double Integrals - Part 2

Lecture 40 - Double Integrals - Part 3

Lecture 41 - Double Integrals - Part 4

Lecture 42 - Double Integrals - Part 5

Lecture 43 - Double Integrals - Part 6

Lecture 44 - Triple Integrals - Part 1

Lecture 45 - Triple Integrals - Part 2

Lecture 46 - Vector Functions

Lecture 47 - Vector and Scalar Fields

Lecture 48 - Divergence and Curl of a Vector Field

Lecture 49 - Line Integrals

Lecture 50 - Conservative Vector Fields

Lecture 51 - Green's Theorem

Lecture 52 - Surface Integrals - Part 1

Lecture 53 - Surface Integrals - Part 2

Lecture 54 - Stokes' Theorem

Lecture 55 - Divergence Theorem

Lecture 56 - Application of Derivatives

Lecture 57 - Application of Derivatives (Continued...)

Lecture 58 - Properties of Gradient, Divergence and Curl

Lecture 59 - Properties of Gradient, Divergence and Curl (Continued...)

Lecture 60 - Curl and Integrals

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 : NOC:Numerical Linear Algebra and Application (Mathematics)

Co-ordinators : Prof. Srinivasa Rao Pentyala

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

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

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

Lecture 1 - Properties of the Image of an Analytic Function - Introduction to the Picard Theorems

Lecture 2 - Recalling Singularities of Analytic Functions - Non-isolated and Isolated Removable, Pole and Essential Singularities

Lecture 3 - Recalling Riemann's Theorem on Removable Singularities

Lecture 4 - Casorati-Weierstrass Theorem; Dealing with the Point at Infinity -- Riemann Sphere and Riemann Stereographic Projection

Lecture 5 - Neighborhood of Infinity, Limit at Infinity and Infinity as an Isolated Singularity

Lecture 6 - Studying Infinity - Formulating Epsilon-Delta Definitions for Infinite Limits and Limits at Infinity

Lecture 7 - When is a function analytic at infinity ?

Lecture 8 - Laurent Expansion at Infinity and Riemann\'s Removable Singularities Theorem for the Point at Infinity

Lecture 9 - The Generalized Liouville Theorem - Little Brother of Little Picard and Analogue of Casorati-Weierstrass; Failure of Cauchy\'s Theorem at Infinity

Lecture 10 - Morera\'s Theorem at Infinity, Infinity as a Pole and Behaviour at Infinity of Rational and Meromorphic Functions

Lecture 11 - Residue at Infinity and Introduction to the Residue Theorem for the Extended Complex Plane - Residue Theorem for the Point at Infinity

Lecture 12 - Proofs of Two Avatars of the Residue Theorem for the Extended Complex Plane and Applications of the Residue at Infinity

Lecture 13 - Infinity as an Essential Singularity and Transcendental Entire Functions

Lecture 14 - Meromorphic Functions on the Extended Complex Plane are Precisely Quotients of Polynomials

Lecture 15 - The Ubiquity of Meromorphic Functions - The Nerves of the Geometric Network Bridging Algebra, Analysis and Topology

Lecture 16 - Continuity of Meromorphic Functions at Poles and Topologies of Spaces of Functions

Lecture 17 - Why Normal Convergence, but Not Globally Uniform Convergence, is the Inevitable in Complex Analysis

Lecture 18 - Measuring Distances to Infinity, the Function Infinity and Normal Convergence of Holomorphic Functions in the Spherical Metric

Lecture 19 - The Invariance Under Inversion of the Spherical Metric on the Extended Complex Plane

Lecture 20 - Introduction to Hurwitz\'s Theorem for Normal Convergence of Holomorphic Functions in the Spherical Metric

Lecture 21 - Completion of Proof of Hurwitz\'s Theorem for Normal Limits of Analytic Functions in the Spherical Metric

Lecture 22 - Hurwitz\'s Theorem for Normal Limits of Meromorphic Functions in the Spherical Metric

Lecture 23 - What could the Derivative of a Meromorphic Function Relative to the Spherical Metric Possibly Be ?

Lecture 24 - Defining the Spherical Derivative of a Meromorphic Function

Lecture 25 - Well-definedness of the Spherical Derivative of a Meromorphic Function at a Pole and Inversion-invariance of the Spherical Derivative

Lecture 26 - Topological Preliminaries - Translating Compactness into Boundedness

Lecture 27 - Introduction to the Arzela-Ascoli Theorem - Passing from abstract Compactness to verifiable Equicontinuity

Lecture 28 - Proof of the Arzela-Ascoli Theorem for Functions - Abstract Compactness Implies Equicontinuity

Lecture 29 - Proof of the Arzela-Ascoli Theorem for Functions - Equicontinuity Implies Compactness

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

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

Lecture 31 - The Field of Rational Functions or Function Field of a Variety - The Local Ring at the Generic Point

Lecture 32 - Fields of Rational Functions or Function Fields of Affine and Projective Varieties and their Relationships with Dimensions

Lecture 33 - Global Regular Functions on Projective Varieties are Simply the Constants

Lecture 34 - The d-Uple Embedding and the Non-Intrinsic Nature of the Homogeneous Coordinate Ring of a Projective Variety

Lecture 35 - The Importance of Local Rings - A Morphism is an Isomorphism if it is a Homeomorphism and Induces Isomorphisms at the Level of Local Rings

Lecture 36 - The Importance of Local Rings - A Rational Function in Every Local Ring is Globally Regular

Lecture 37 - Geometric Meaning of Isomorphism of Local Rings - Local Rings are Almost Global

Lecture 38 - Local Ring Isomorphism,Equals Function Field Isomorphism, Equals Birationality

Lecture 39 - Why Local Rings Provide Calculus Without Limits for Algebraic Geometry Pun Intended!

Lecture 40 - How Local Rings Detect Smoothness or Nonsingularity in Algebraic Geometry

Lecture 41 - Any Variety is a Smooth Manifold with or without Non-Smooth Boundary

Lecture 42 - Any Variety is a Smooth Hypersurface On an Open Dense Subset

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

Lecture 32 - Numerical Solution of Ordinary Differential Equations - 9

Lecture 33 - Numerical Solution of Ordinary Differential Equations - 10

Lecture 34 - Numerical Solution of Ordinary Differential Equations - 11

Lecture 35 - Root Finding Methods - 1 The Bisection Method - 1

Lecture 36 - Root Finding Methods - 2 The Bisection Method - 2

Lecture 37 - Root Finding Methods - 3 Newton-Raphson Method - 1

Lecture 38 - Root Finding Methods - 4 Newton-Raphson Method - 2

Lecture 39 - Root Finding Methods - 5 Secant Method, Method Of false Position

Lecture 40 - Root Finding Methods - 6 Fixed Point Methods - 1

Lecture 41 - Root Finding Methods - 7 Fixed Point Methods - 2

Lecture 42 - Root Finding Methods - 8 Fixed Point Iteration Methods - 3

Lecture 43 - Root Finding Methods - 9 Practice Problems

Lecture 44 - Solution Of Linear Systems Of Equations - 1

Lecture 45 - Solution Of Linear Systems Of Equations - 2

Lecture 46 - Solution Of Linear Systems Of Equations - 3

Lecture 47 - Solution Of Linear Systems Of Equations - 4

Lecture 48 - Solution Of Linear Systems Of Equations - 5

Lecture 49 - Solution Of Linear Systems Of Equations - 6

Lecture 50 - Solution Of Linear Systems Of Equations - 7

Lecture 51 - Solution Of Linear Systems Of Equations - 8 Iterative Method - 1

Lecture 52 - Solution Of Linear Systems Of Equations - 8 Iterative Method - 2

Lecture 53 - Matrix Eigenvalue Problems - 2 Power Method - 2

Lecture 54 - Practice Problems

NPTEL : NOC:Graph Theory (Mathematics)

Co-ordinators : Dr. Soumen Maity

NPTEL : NOC:Transform Techniques for Engineers (Mathematics)

Co-ordinators : Prof. Srinivasa Manam

Lecture 32 - Review of complex function theory

Lecture 33 - Inverse Laplace transform by contour integration

Lecture 34 - Application of Laplace transforms - ODEs'

Lecture 35 - Solutions of initial or boundary value problems for ODEs'

Lecture 36 - Solving first order PDE's by Laplace transform

Lecture 37 - Solution of wave equation by Laplace transform

Lecture 38 - Solving hyperbolic equations by Laplace transform

Lecture 39 - Solving heat equation by Laplace transform

Lecture 40 - Initial boundary value problems for heat equations

Lecture 41 - Solution of Integral Equations by Laplace Transform

Lecture 42 - Evaluation of Integrals by Laplace Transform

Lecture 43 - Introduction to Z-Transforms

Lecture 44 - Properties of Z-Transforms

Lecture 45 - Inverse Z-transforms

Lecture 46 - Solution of difference equations by Z-transforms

Lecture 47 - Evaluation of infinite sums by Z-transforms

Lecture 48 - conclusions

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

Lecture 32 - Generators and relations for symmetric groups â€“ I

Lecture 33 - Generators and relations for symmetric groups â€“ II

Lecture 34 - Definition of a Ring

Lecture 35 - Euclidean Domains

Lecture 36 - Gaussian Integers

Lecture 37 - The Fundamental Theorem of Arithmetic

Lecture 38 - Divisibility and Ideals

Lecture 39 - Factorization and the Noetherian Condition

Lecture 40 - Examples of Ideals in Commutative Rings

Lecture 41 - Problem Solving/Examples

Lecture 42 - The Ring of Formal Power Series

Lecture 43 - Fraction Fields

Lecture 44 - Path Algebra of a Quiver

Lecture 45 - Ideals In Non-Commutative Rings

Lecture 46 - Product of Rings

Lecture 47 - Ring Homomorphisms

Lecture 48 - Quotient Rings

Lecture 49 - Problem solving

Lecture 50 - Tensor and Exterior Algebras

Lecture 51 - Modules: definition

Lecture 52 - Modules over polynomial rings $K[x]$

Lecture 53 - Modules: alternative definition

Lecture 54 - Modules: more examples

Lecture 55 - Submodules

Lecture 56 - General constructions of submodules

Lecture 57 - Problem Solving

Lecture 58 - Quotient modules

Lecture 59 - Homomorphisms

Lecture 60 - More examples of homomorphisms

Lecture 61 - First isomorphism theorem

Lecture 62 - Direct sums of modules

Lecture 63 - Complementary submodules

Lecture 64 - Change of ring

NPTEL : NOC:Computational Commutative Algebra (Mathematics)

Co-ordinators : Prof. Manoj Kummini

NPTEL : NOC:Laplace Transform (Mathematics)

Co-ordinators : Prof. Indrava Roy

Lecture 1 - Introduction and Motivation for Laplace transforms - Part 1

Lecture 2 - Introduction and Motivation for Laplace transforms - Part 2

Lecture 3 - Improper Riemann integrals: Definition and Existence - Part 1

Lecture 4 - Improper Riemann integrals: Definition and Existence - Part 2

Lecture 5 - Existence of Laplace transforms and Examples

Lecture 6 - Properties of Laplace transforms-I - Part 1

Lecture 7 - Properties of Laplace transforms-I - Part 2

Lecture 8 - Existence of Laplace transforms for functions with vertical asymptote at the Y-axis - Part 1

Lecture 9 - Existence of Laplace transforms for functions with vertical asymptote at the Y-axis - Part 2

Lecture 10 - Properties of Laplace transforms-II - Part 1

Lecture 11 - Properties of Laplace transforms-II - Part 2

Lecture 12 - Laplace transform of Derivatives - Part 1

Lecture 13 - Laplace transform of Derivatives - Part 2

Lecture 14 - Laplace transform of Periodic functions and Integrals - I

Lecture 15 - Laplace transform of Integrals-II - Part 1

Lecture 16 - Laplace transform of Integrals-II - Part 2

Lecture 17 - Inverse Laplace transform and asymptotic behaviour - Part 1

Lecture 18 - Inverse Laplace transform and asymptotic behaviour - Part 2

Lecture 19 - Methods of finding Inverse Laplace transform-I- Partial Fractions

Lecture 20 - Methods of finding Inverse Laplace transform-II- Convolution theorem

Lecture 21 - Convolution theorem for Laplace transforms

Lecture 22 - Applications of Laplace transforms

Lecture 23 - Applications of Laplace Transform to physical systems

Lecture 24 - Solving Linear ODE's with polynomial coefficients

Lecture 25 - Integral and Integro-differential equation

Lecture 26 - Further application of Laplace transforms - Part 1

Lecture 27 - Further application of Laplace transforms - Part 2

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

Co-ordinators : Prof. Indrava Roy

NPTEL : NOC:Complex Analysis (Mathematics)

Co-ordinators : Prof. Pranav Haridas

Lecture 1 - Field of Complex Numbers

Lecture 2 - Conjugation and Absolute value

Lecture 3 - Topology on Complex plane

Lecture 4 - Topology on Complex Plane (Continued...)

Lecture 5 - Problem Session

Lecture 6 - Isometries on the Complex Plane

Lecture 7 - Functions on the Complex Plane

Lecture 8 - Complex differentiability

Lecture 9 - Power Series

Lecture 10 - Differentiation of power series

Lecture 11 - Problem Session

Lecture 12 - Cauchy-Riemann equations

Lecture 13 - Harmonic functions

Lecture 14 - MÃ¶bius transformations

Lecture 15 - Problem session

Lecture 16 - Curves in the complex plane

Lecture 17 - Complex Integration over curves

Lecture 18 - First Fundamental theorem of Calculus

Lecture 19 - Second Fundamental theorem of Calculus

Lecture 20 - Problem session

Lecture 21 - Homotopy of curves

Lecture 22 - Cauchy-Goursat theorem

Lecture 23 - Cauchy's theorem

Lecture 24 - Problem Session

Lecture 25 - Cauchy Integral Formula

Lecture 26 - Principle of analytic continuation and Cauchy estimates

Lecture 27 - Further consequences of Cauchy Integral Formula

Lecture 28 - Problem session

Lecture 29 - Winding number

Lecture 30 - Open mapping theorem

Lecture 31 - Schwarz reflection principle

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

NPTEL : NOC:Introduction to Galois Theory (Mathematics)

Co-ordinators : Prof. Krishna Hanumanthu

Lecture 32 - Kummer extensions - Part 1

Lecture 33 - Kummer extensions - Part 2

Lecture 34 - Kummer extensions - Part 3

Lecture 35 - Cyclotomic extensions - Part 1

Lecture 36 - Cyclotomic extensions - Part 2

Lecture 37 - Solvability by radicals

Lecture 38 - Characterizations of solvability - Part 1

Lecture 39 - Characterizations of solvability - Part 2

Lecture 40 - Discriminants, Galois groups of polynomials

Lecture 41 - Quartics are solvable

Lecture 42 - Solvable groups - Part 1

Lecture 43 - Solvable groups - Part 2

Lecture 44 - Solvable groups - Part 3

Lecture 45 - Insolvability of quintics

Lecture 46 - Problem Session - Part 10

Lecture 47 - Problem Session - Part 11

Lecture 48 - Problem Session - Part 12

Lecture 49 - Problem Session - Part 13

NPTEL : NOC:Basic Calculus 1 (Mathematics)

Co-ordinators : Prof. Arindama Singh

Lecture 32 - Differentiation exercises - Part 2

Lecture 33 - Maxima and minima - Part 1

Lecture 34 - Maxima and minima - Part 2

Lecture 35 - Rolleâ€™s theorem and mean value theorem - Part 1

Lecture 36 - Rolleâ€™s theorem and mean value theorem - Part 2

Lecture 37 - Using Rolleâ€™s theorem and Mean value theorem - Part 1

Lecture 38 - Using Rolleâ€™s theorem and Mean value theorem - Part 2

Lecture 39 - First derivative test - Part 1

Lecture 40 - First derivative test - Part 2

Lecture 41 - Second derivative test - Part 1

Lecture 42 - Second derivative test - Part 2

Lecture 43 - Concavity - Part 1

Lecture 44 - Concavity - Part 2

Lecture 45 - Linearization and differential - Part 1

Lecture 46 - Linearization and differential - Part 2

Lecture 47 - Lâ€™Hospitalâ€™s rules - Part 1

Lecture 48 - Lâ€™Hospitalâ€™s rules - Part 2

Lecture 49 - Definite integral - Part 1

Lecture 50 - Definite integral - Part 2

Lecture 51 - Properties of integral - Part 1

Lecture 52 - Properties of integral - Part 2

Lecture 53 - Fundamental theorem of calculus - Part 1

Lecture 54 - Fundamental theorem of calculus - Part 2

Lecture 55 - Applications of Funda - mental theorem of calculus - Part 1

Lecture 56 - Applications of Funda - mental theorem of calculus - Part 2

Lecture 57 - Rule of substitution - Part 1

Lecture 58 - Rule of substitution - Part 2

Lecture 59 - Area between curves - Part 1

Lecture 60 - Area between curves - Part 2

Lecture 61 - Volumes by slicing - Part 1

Lecture 62 - Volumes by slicing - Part 2

Lecture 63 - The disk method - Part 1

Lecture 64 - The disk method - Part 2

NPTEL : NOC:Functional Analysis (Mathematics)

Co-ordinators : Prof. Kesavan

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

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

Lecture 32 - Fatou's lemma

Lecture 33 - Integrable functions

Lecture 34 - Dominated convergence theorem

Lecture 35 - Dominated convergence theorem: Applications

Lecture 36 - Absolute continuity

Lecture 37 - Integration on the real line

Lecture 38 - Examples

Lecture 39 - Weierstrass' theorem

Lecture 40 - Exercises

Lecture 41 - Exercises

Lecture 42 - Vitali covering lemma

Lecture 43 - Monotonic functions

Lecture 44 - Functions of bounded variation

Lecture 45 - Functions of bounded variation

Lecture 46 - Functions of bounded variation

Lecture 47 - Differentiation of an indefinite integral

Lecture 48 - Absolute continuity

Lecture 49 - Exercises

Lecture 50 - Product spaces

Lecture 51 - Product spaces: measurable functions

Lecture 52 - Product measure

Lecture 53 - Fubini's theorem

Lecture 54 - Examples

Lecture 55 - Examples

Lecture 56 - Integration of radial functions

Lecture 57 - Measure of the unit ball in N dimensions

Lecture 58 - Exercises

Lecture 59 - Signed measures

Lecture 60 - Hahn and Jordan decompositions

Lecture 61 - Upper,lower and totaal variations of a signed measure; Absolute continuity

Lecture 62 - Absolute continuity

Lecture 63 - Radon-Nikodym theorem

Lecture 64 - Radon-Nikodym theorem

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

Co-ordinators : Prof. Balasubramaniam Jayaram

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

Lecture 32 - Ring of Germs of Regular Functions at a point, Field of Rational Functions

Lecture 33 - Tutorial 5 : Sheafification

Lecture 34 - Ring of Regular Functions, Local Ring at a Point,and Field of Rational Functions of an AffineVariety

Lecture 35 - Equivalence of Categories of the Category of Affine Varieties over a Field k and the Category

Lecture 36 - Equivalence of Categories of the Category of Affine Varieties over a Field k (Continued...)

Lecture 37 - Some Examples, Open Immersions and Closed Immersions

Lecture 38 - Product of Quasi-affine Varieties

Lecture 39 - Diagonal Morphisms, Abstract Varieties

Lecture 40 - Tutorial 6 : Normal Varieties and Normalization of a Variety

Lecture 41 - Projective Varieties Revisited - Part 1

Lecture 42 - Projective Varieties Revisited - Part 2

Lecture 43 - Global Regular Functions on ProjectiveVarieties are Constants - Part 1

Lecture 44 - Global Regular Functions on ProjectiveVarieties are Constants - Part 2

Lecture 45 - Product of Prevarieties - Part 1

Lecture 46 - Product of Prevarieties - Part 2

Lecture 47 - Tutorial 7 : A Result on Tensor Products of k-algebras

Lecture 48 - Morphisms of Prevarieties - Part 1

Lecture 49 - Morphisms of Prevarieties - Part 2

Lecture 50 - Finite Morphisms - Part 1

Lecture 51 - Finite Morphisms - Part 2

Lecture 52 - Fiber Products

Lecture 53 - Tutorial 8 : Finite Morphisms

Lecture 54 - Immersions

Lecture 55 - Fiber Products, Separatedness

Lecture 56 - Criterion of Separatedness

Lecture 57 - Proper Morphisms and Complete Varieties

Lecture 58 - Tutorial 9 : Closed Immersions and Graph of a Morphism

Lecture 59 - Projective Varieties are Complete

Lecture 60 - Zariski Tangent Space, Singular and Nonsingular Points

Lecture 61 - Smooth Points Form a Non-empty Open Subset

Lecture 62 - Blow-Ups, Rational Maps and Birational Maps

Lecture 63 - Tutorial 10 : Zariski Tangent Space at a Point of an Affine Variety

Lecture 64 - Blow-Ups (Continued...)

NPTEL : NOC:Introduction to Statistics (Mathematics)

Co-ordinators : Prof. Sameen Naqvi

Lecture 32 - EM algorithm - Part 1

Lecture 33 - EM algorithm - Part 2

Lecture 34 - Python - Session 14

Lecture 35 - Python - Session 15

Lecture 36 - Hypothesis Testing - Part 1

Lecture 37 - Hypothesis Testing - Part 2

Lecture 38 - Hypothesis Testing - Part 3

Lecture 39 - Python - Session 16

Lecture 40 - Python - Session 17

Lecture 41 - Hypothesis Testing for two sample problem - Part 1

Lecture 42 - Hypothesis Testing for two sample problem - Part 2

Lecture 43 - Hypothesis Testing for two sample problem - Part 3

Lecture 44 - Python - Session 18

Lecture 45 - Python - Session 19

Lecture 46 - Bootstrap Hypothesis Testing - Part 1

Lecture 47 - Python - Session 20

Lecture 48 - Python - Session 21

Lecture 49 - Bootstrap Hypothesis Testing - Part 2

Lecture 50 - Python - Session 22

Lecture 51 - Confidence Interval Estimation - Part 1

Lecture 52 - Confidence Interval Estimation - Part 2

Lecture 53 - Confidence Interval Estimation - Part 3

Lecture 54 - Python - Session 23

Lecture 55 - Python - Session 24

Lecture 56 - Confidence interval for two sample problem

Lecture 57 - Python - Session 25

Lecture 58 - Bootstrap Confidence Interval

Lecture 59 - Python - Session 26

Lecture 60 - Python - Session 27

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

Lecture 32 - Initial and final value theorems for Laplace transforms

Lecture 33 - Laplace transforms of periodic functions

Lecture 34 - Laplace transforms of Heaviside unit step function

Lecture 35 - Laplace transforms of Dirac delta function

Lecture 36 - Applications of Laplace transforms - I

Lecture 37 - Applications of Laplace transforms - II

Lecture 38 - Applications of Laplace transforms - III

Lecture 39 - ZÂ–transform and inverse Z-transform of elementary functions

Lecture 40 - Properties of Z-transforms - I

Lecture 41 - Properties of Z-transforms - II

Lecture 42 - Initial and final value theorem for Z-transforms

Lecture 43 - Convolution theorem for Z-transforms

Lecture 44 - Applications of Z-transforms - I

Lecture 45 - Applications of Z-transforms - II

Lecture 46 - Applications of Z-transforms - III

Lecture 47 - Fourier series and its convergence - I

Lecture 48 - Fourier series and its convergence - II

Lecture 49 - Fourier series of even and odd functions

Lecture 50 - Fourier half-range series

Lecture 51 - ParsevelÂ’s Identity

Lecture 52 - Complex form of Fourier series

Lecture 53 - Fourier integrals

Lecture 54 - Fourier sine and cosine integrals

Lecture 55 - Fourier transforms

Lecture 56 - Fourier sine and cosine transforms

Lecture 57 - Convolution theorem for Fourier transforms

Lecture 58 - Applications of Fourier transforms to BVP - I

Lecture 59 - Applications of Fourier transforms to BVP - II

Lecture 60 - Applications of Fourier transforms to BVP - III

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 1 - Formulation of Dynamical Systems - I

Lecture 2 - Formulation of Dynamical Systems - II

Lecture 3 - Existence and Uniqueness Theorem - I

Lecture 4 - Existence and Uniqueness Theorem - II

Lecture 5 - Linear Systems - I

Lecture 6 - Linear Systems - II

Lecture 7 - Solutions of Linear Systems - I

Lecture 8 - Solutions of Linear Systems - II

Lecture 9 - Solutions of Linear Systems - III

Lecture 10 - Fundamental Matrix - I

Lecture 11 - Fundamental Matrix - II

Lecture 12 - Fundamental Matrix for Non-Autonomous systems

Lecture 13 - Solutions of Non-Homogeneous Systems

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Lecture 16 - Stability of Linear Autonomous Systems - II

Lecture 17 - Stability of Linear Autonomous Systems - III

Lecture 18 - Stability of Weakly Non-Linear Systems - I

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Lecture 20 - Stability of Non-Linear Systems using Linearization

Lecture 21 - Properties of Phase Portrait

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Lecture 23 - Phase Portrait: Types of Critical Points

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Lecture 28 - Limit Cycle

Lecture 29 - Lyapunov Stability - I

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Lecture 31 - Introduction to Control Systems - I

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Lecture 33 - Controllability of Autonomous Systems

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Lecture 59 - Relation between Continuous and Discrete Systems - I

Lecture 60 - Relation between Continuous and Discrete Systems - II

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Lecture 1 - Introduction to Algebraic Structures - Rings and Fields

Lecture 2 - Definition of Vector Spaces

Lecture 3 - Examples of Vector Spaces

Lecture 4 - Definition of subspaces

Lecture 5 - Examples of subspaces

Lecture 6 - Examples of subspaces (Continued...)

Lecture 7 - Sum of subspaces

Lecture 8 - System of linear equations

Lecture 9 - Gauss elimination

Lecture 10 - Generating system, linear independence and bases

Lecture 11 - Examples of a basis of a vector space

Lecture 12 - Review of univariate polynomials

Lecture 13 - Examples of univariate polynomials and rational functions

Lecture 14 - More examples of a basis of vector spaces

Lecture 15 - Vector spaces with finite generating system

Lecture 16 - Steinitzs exchange theorem and examples

Lecture 17 - Examples of finite dimensional vector spaces

Lecture 18 - Dimension formula and its examples

Lecture 19 - Existence of a basis

Lecture 20 - Existence of a basis (Continued...)

Lecture 21 - Existence of a basis (Continued...)

Lecture 22 - Introduction to Linear Maps

Lecture 23 - Examples of Linear Maps

Lecture 24 - Linear Maps and Bases

Lecture 25 - Pigeonhole principle in Linear Algebra

Lecture 26 - Interpolation and the rank theorem

Lecture 27 - Examples

Lecture 28 - Direct sums of vector spaces

Lecture 29 - Projections

Lecture 30 - Direct sum decomposition of a vector space

Lecture 31 - Dimension equality and examples

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