

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Natural Language Processing

Subject Co-ordinator - Prof. Pushpak Bhattacharya

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Stages of NLP
- Lecture 3 - Stages of NLP Continue...
- Lecture 4 - Two approaches to NLP
- Lecture 5 - Sequence Labelling and Noisy Channel
- Lecture 6 - Noisy Channel
- Lecture 7 - Argmax Based Computation
- Lecture 8 - Noisy Channel Application to NLP
- Lecture 9 - Brief on Probabilistic Parsing & Start of Part of Speech Tagging
- Lecture 10 - Part of Speech Tagging
- Lecture 11 - Part of Speech Tagging counted ...
- Lecture 12 - Part of Speech Tagging counted ... and Indian Language in Focus; Morphology Analysis
- Lecture 13 - PoS Tagging contd... , Indian Language Consideration; Accuracy Measure
- Lecture 14 - PoS Tagging; Fundamental Principle; Why Challenging; accuracy
- Lecture 15 - PoS Tagging; Accuracy Measurement; Word categories
- Lecture 16 - AI and Probability; HMM
- Lecture 17 - HMM
- Lecture 18 - HMM, Viterbi, Forward Backward Algorithm
- Lecture 19 - HMM, Viterbi, Forward Backward Algorithm (Continued...)
- Lecture 20 - HMM, Forward Backward Algorithms, Baum Welch Algorithm
- Lecture 21 - HMM, Forward Backward Algorithms, Baum Welch Algorithm (Continued...)
- Lecture 22 - Natural Language Processing and Informational Retrieval
- Lecture 23 - CLIA; IR Basics
- Lecture 24 - IR Models
- Lecture 25 - IR Models
- Lecture 26 - NLP and IR
- Lecture 27 - Least Square Method; Recap of PCA; Towards Latent Semantic Indexing (LSI)
- Lecture 28 - PCA; SVD; Towards Latent Semantic Indexing (LSI)
- Lecture 29 - Wordnet and Word Sense Disambiguation

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- Lecture 30 - Wordnet and Word Sense Disambiguation (Continued...)
- Lecture 31 - Wordnet; Metonymy and Word Sense Disambiguation
- Lecture 32 - Word Sense Disambiguation
- Lecture 33 - Word Sense Disambiguation; Overlap Based Method; Supervised Method
- Lecture 34 - Word Sense Disambiguation
- Lecture 35 - Word Sense Disambiguation
- Lecture 36 - Resource Constrained WSD; Parsing
- Lecture 37 - Parsing
- Lecture 38 - Parsing Algorithm
- Lecture 39 - Parsing Ambiguous Sentences; Probabilistic Parsing
- Lecture 40 - Probabilistic Parsing Algorithms

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Design and Analysis of Algorithms

Subject Co-ordinator - Prof. Sundar Viswanathan, Prof. Ajit A Diwan, Prof. Abhiram G Ranade

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Overview of the course
- Lecture 2 - Framework for Algorithms Analysis
- Lecture 3 - Algorithms Analysis Framework - II
- Lecture 4 - Asymptotic Notations
- Lecture 5 - Algorithm Design Techniques
- Lecture 6 - Divide And Conquer - I
- Lecture 7 - Divide And Conquer - II Median Finding
- Lecture 8 - Divide And Conquer - III Surfing Lower Bounds
- Lecture 9 - Divide And Conquer - IV Closest Pair
- Lecture 10 - Greedy Algorithms - I
- Lecture 11 - Greedy Algorithms - II
- Lecture 12 - Greedy Algorithms - III
- Lecture 13 - Greedy Algorithms - IV
- Lecture 14 - Pattern Matching - I
- Lecture 15 - Pattern Matching - II
- Lecture 16 - Combinational Search and Optimization - I
- Lecture 17 - Combinational Search and Optimization - II
- Lecture 18 - Dynamic Programming
- Lecture 19 - Longest Common Subsequences
- Lecture 20 - Matrix Chain Multiplication
- Lecture 21 - Scheduling with Startup and Holding Costs
- Lecture 22 - Average case Analysis of Quicksort
- Lecture 23 - Bipartite Maximum Matching
- Lecture 24 - Lower Bounds for Sorting
- Lecture 25 - Element Distinctness Lower Bounds
- Lecture 26 - NP-Completeness - I - Motivation
- Lecture 27 - NP-Completeness - II
- Lecture 28 - NP-Completeness - III
- Lecture 29 - NP-Completeness - IV

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- Lecture 30 - NP-Completeness - V
- Lecture 31 - NP-Completeness - VI
- Lecture 32 - Approximation Algorithms
- Lecture 33 - Approximation Algorithms
- Lecture 34 - Approximation Algorithms for NP

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Software Engineering

Subject Co-ordinator - Prof. N.L. Sarda, Prof. Umesh Bellur, Prof. Rushikesh K Joshi

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Software Engineering - Challenges
- Lecture 2 - Introduction to Software Engineering
- Lecture 3 - Overview of Phases
- Lecture 4 - Overview of Phases
- Lecture 5 - Requirements Engineering / Specification
- Lecture 6 - Formal Specification
- Lecture 7 - Algebraic Specification Methods
- Lecture 8 - Systems Modeling Overview
- Lecture 9 - Process Modeling - DFD , Function Decomp
- Lecture 10 - Process Modeling - DFD, Function Decomp
- Lecture 11 - Data Modeling - ER Diagrams, Mapping
- Lecture 12 - Data Modeling - ER Diagrams, Mapping
- Lecture 13 - Production Quality Software - Introduction
- Lecture 14 - Software Design - Primary Consideration
- Lecture 15 - Design Patterns
- Lecture 16 - Class and Component Level Design
- Lecture 17 - Architectural Design
- Lecture 18 - Software Testing - I
- Lecture 19 - Software Testing - II
- Lecture 20 - Structural Programming and Some implementation
- Lecture 21 - Software Metrics and Quality
- Lecture 22 - Verification and Validation
- Lecture 23 - Case Study
- Lecture 24 - Case Study
- Lecture 25 - Software Evolution
- Lecture 26 - Agile Development
- Lecture 27 - Software Reuse CBSE
- Lecture 28 - Reuse Continued
- Lecture 29 - Introduction to Project Management

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- Lecture 30 - Project Scope Management
- Lecture 31 - Project Time Management
- Lecture 32 - Estimation - I
- Lecture 33 - Estimation - II
- Lecture 34 - Project Quality Management
- Lecture 35 - Quality Management Systems - I
- Lecture 36 - Quality Management Systems
- Lecture 37 - Project Configuration Management
- Lecture 38 - Project Risk Management
- Lecture 39 - Other PM Processes

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Software Testing (2017)

Subject Co-ordinator - Prof. Meenakshi D'souza

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Motivation  
Lecture 2 - Terminologies  
Lecture 3 - Testing based on Models and Criteria  
Lecture 4 - Automation - JUnit as an example  
Lecture 5 - Basics of Graphs  
Lecture 6 - Structural Graph Coverage Criteria  
Lecture 7 - Elementary Graph Algorithms - Part 1  
Lecture 8 - Elementary Graph Algorithms - Part 2  
Lecture 9 - Algorithms  
Lecture 10 - Assignment 2  
Lecture 11 - Data Flow Graphs  
Lecture 12 - Algorithms  
Lecture 13 - Graph Coverage Criteria  
Lecture 14 - Testing Source Code  
Lecture 15 - Data Flow Graph Coverage Criteria  
Lecture 16 - Software Design and Integration Testing  
Lecture 17 - Design Integration Testing and Graph Coverage  
Lecture 18 - Specification Testing and Graph Coverage  
Lecture 19 - Graph Coverage and Finite state Machines  
Lecture 20 - Assignment 4  
Lecture 21 - Logic  
Lecture 22 - Logic  
Lecture 23 - Coverage Criteria, (Continued...)  
Lecture 24 - Logic Coverage Criteria  
Lecture 25 - Logic Coverage Criteria  
Lecture 26 - Logic Coverage Criteria  
Lecture 27 - Logic Coverage Criteria  
Lecture 28 - Logic Coverage Criteria  
Lecture 29 - Logic Coverage Criteria

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Week 6 Assignment Solving
- Lecture 31 - Functional Testing
- Lecture 32 - Input Space Partitioning
- Lecture 33 - Input Space Partitioning
- Lecture 34 - Input Space Partitioning Coverage Criteria
- Lecture 35 - Syntax-Based Testing
- Lecture 36 - Mutation Testing
- Lecture 37 - Mutation Testing for Programs
- Lecture 38 - Mutation Testing
- Lecture 39 - Mutation Testing Vs. Graphs and Logic Based Testing
- Lecture 40 - Assignment Solving for Week8
- Lecture 41 - Mutation testing
- Lecture 42 - Mutation Testing
- Lecture 43 - Mutation testing
- Lecture 44 - Software Testing Course
- Lecture 45 - Testing of web Applications and Web Services
- Lecture 46 - Testing of web Applications and Web Services
- Lecture 47 - Testing of web Applications and Web Services
- Lecture 48 - Testing of Object-Oriented Applications
- Lecture 49 - Testing of Object-Oriented Applications
- Lecture 50 - Symbolic Testing - 1
- Lecture 51 - Symbolic Testing - 2
- Lecture 52 - DART
- Lecture 53 - DART
- Lecture 54 - DART
- Lecture 55 - Testing of Object-Oriented Applications
- Lecture 56 - Testing of Mobile Applications
- Lecture 57 - Non-Functional System Testing
- Lecture 58 - Regression Testing
- Lecture 59 - Assignment
- Lecture 60 - Software Testing



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Design and Pedagogy of the Introductory Programming

Subject Co-ordinator - Prof. Abhiram G Ranade

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Course Overview  
Lecture 2 - Introduction and Survey.0  
Lecture 3 - Introduction and Survey.1  
Lecture 4 - Introduction and Survey.2  
Lecture 5 - Basic Ideas in Our Approach.0  
Lecture 6 - Basic Ideas in Our Approach.1  
Lecture 7 - Basic Ideas in Our Approach.2  
Lecture 8 - Basic Ideas in Our Approach.3  
Lecture 9 - Basic Ideas in Our Approach.4  
Lecture 10 - Basic Ideas in Our Approach.5  
Lecture 11 - Basic Ideas in Our Approach.6  
Lecture 12 - Pedagogy.0  
Lecture 13 - Pedagogy.1  
Lecture 14 - Pedagogy.2  
Lecture 15 - Pedagogy.3  
Lecture 16 - Pedagogy.4  
Lecture 17 - Advanced Programming Topics.0  
Lecture 18 - Advanced Programming Topics.1  
Lecture 19 - Advanced Programming topics.2  
Lecture 20 - In class questions, Assignments, Examinations.0  
Lecture 21 - In class questions, Assignments, Examinations.1  
Lecture 22 - Summing up

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:An Introduction to Programming through C++

Subject Co-ordinator - Prof. Abhiram G Ranade

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction - Part 1  
Lecture 2 - Introduction - Part 2  
Lecture 3 - Introduction - Part 3  
Lecture 4 - Introduction - Part 4  
Lecture 5 - Problem Solving using Computer - Part 1  
Lecture 6 - Problem Solving using Computer - Part 2  
Lecture 7 - Problem Solving using Computer - Part 3  
Lecture 8 - Problem Solving using Computer - Part 4  
Lecture 9 - Problem Solving using Computer - Part 5  
Lecture 10 - Basic Elements of Program - Part 1  
Lecture 11 - Basic Elements of Program - Part 2  
Lecture 12 - Basic Elements of Program - Part 3  
Lecture 13 - Basic Elements of Program - Part 4  
Lecture 14 - Program Design - Part 1  
Lecture 15 - Program Design - Part 2  
Lecture 16 - Program Design - Part 3  
Lecture 17 - Simple cpp Graphics  
Lecture 18 - Conditional Execution - Part 1  
Lecture 19 - Most general form of if - Part 2  
Lecture 20 - More general form of conditions - Part 3  
Lecture 21 - A somewhat large program example - Part 4  
Lecture 22 - Switch statement and logical data - Part 5  
Lecture 23 - Loops - Part 1  
Lecture 24 - Mark averaging - Part 2  
Lecture 25 - The break and continue statements - Part 3  
Lecture 26 - The for statement - Part 4  
Lecture 27 - Euclid's algorithm for GCD - Part 5  
Lecture 28 - Correctness proof for GCD - Part 6  
Lecture 29 - Computing Mathematical Functions - Part 1

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- Lecture 30 - Computing Mathematical Functions - Part 2
- Lecture 31 - Computing Mathematical Functions - Part 3
- Lecture 32 - Computing Mathematical Functions - Part 4
- Lecture 33 - Loops in various applications - Part 1
- Lecture 34 - Loops in various applications - Part 2
- Lecture 35 - Loops in various applications - Part 3
- Lecture 36 - Loops in various applications - Part 4
- Lecture 37 - Loops in various applications - Part 5
- Lecture 38 - Functions - Part 1
- Lecture 39 - Functions - Part 2
- Lecture 40 - Functions - Part 3
- Lecture 41 - Functions - Part 4
- Lecture 42 - Functions - Part 5
- Lecture 43 - Recursion - Part 1
- Lecture 44 - Recursion - Part 2
- Lecture 45 - Recursion - Part 3
- Lecture 46 - Virahanka Numbers - Part 1
- Lecture 47 - Virahanka Numbers - Part 2
- Lecture 48 - Virahanka Numbers - Part 3
- Lecture 49 - Program Organization and Functions - Part 1
- Lecture 50 - Program Organization and Functions - Part 2
- Lecture 51 - Program Organization and Functions - Part 3
- Lecture 52 - Program Organization and Functions - Part 4
- Lecture 53 - Advanced Features of Functions - Part 1
- Lecture 54 - Advanced Features of Functions - Part 2
- Lecture 55 - Advanced Features of Functions - Part 3
- Lecture 56 - Advanced Features of Functions - Part 4
- Lecture 57 - Array Part-1 - Part 1
- Lecture 58 - Array Part-1 - Part 2
- Lecture 59 - Array Part-1 - Part 3
- Lecture 60 - Array Part-1 - Part 4
- Lecture 61 - Array Part-1 - Part 5
- Lecture 62 - Array Part-1 - Part 6
- Lecture 63 - Array Part-1 - Part 7
- Lecture 64 - Array Part-1 - Part 8
- Lecture 65 - Array Part-1 - Part 9
- Lecture 66 - Array Part-2 - Part 1
- Lecture 67 - Array Part-2 - Part 2
- Lecture 68 - Array Part-2 - Part 3

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- Lecture 69 - Array Part-2 - Part 4
- Lecture 70 - More on Arrays - Part 1
- Lecture 71 - More on Arrays - Part 2
- Lecture 72 - More on Arrays - Part 3
- Lecture 73 - More on Arrays - Part 4
- Lecture 74 - Arrays and recursion - Part 1
- Lecture 75 - Arrays and recursion - Part 2
- Lecture 76 - Arrays and recursion - Part 3
- Lecture 77 - Arrays and recursion - Part 4
- Lecture 78 - Arrays and recursion - Part 5
- Lecture 79 - Structures - Part 1
- Lecture 80 - Structures - Part 2
- Lecture 81 - Structures - Part 3
- Lecture 82 - Structures - Part 4
- Lecture 83 - Structures Part 2 - Part 1
- Lecture 84 - Structures Part 2 - Part 2
- Lecture 85 - Structures Part 2 - Part 3
- Lecture 86 - Classes - Part 1
- Lecture 87 - Classes - Part 2
- Lecture 88 - Classes - Part 3
- Lecture 89 - Classes - Part 4
- Lecture 90 - Classes - Part 5
- Lecture 91 - Classes - Part 6
- Lecture 92 - Representing variable length entities - Part 1
- Lecture 93 - Representing variable length entities - Part 2
- Lecture 94 - Representing variable length entities - Part 3
- Lecture 95 - Representing variable length entities - Part 4
- Lecture 96 - Representing variable length entities - Part 5
- Lecture 97 - Representing variable length entities - Part 6
- Lecture 98 - Representing variable length entities - Part 7
- Lecture 99 - The Standard Library - Part 1
- Lecture 100 - The Standard Library - Part 2
- Lecture 101 - The Standard Library - Part 3
- Lecture 102 - The Standard Library - Part 4
- Lecture 103 - The Standard Library - Part 5
- Lecture 104 - Data structure based programming - Part 1
- Lecture 105 - Data structure based programming - Part 2
- Lecture 106 - Data structure based programming - Part 3
- Lecture 107 - Data structure based programming - Part 4

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- Lecture 108 - Data structure based programming - Part 5
- Lecture 109 - Medium size programs - Part 1
- Lecture 110 - Medium size programs - Part 2
- Lecture 111 - Medium size programs - Part 3
- Lecture 112 - Medium size programs - Part 4
- Lecture 113 - A graphical editor and solver for circuits - Part 1
- Lecture 114 - A graphical editor and solver for circuits - Part 2
- Lecture 115 - A graphical editor and solver for circuits - Part 3
- Lecture 116 - A graphical editor and solver for circuits - Part 4
- Lecture 117 - Cosmological simulation - Part 1
- Lecture 118 - Cosmological simulation - Part 2
- Lecture 119 - Cosmological simulation - Part 3
- Lecture 120 - Cosmological simulation - Part 4

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Demystifying Networking

Subject Co-ordinator - Prof.Sridhar Iyer

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Analogy for CEO's Problem
- Lecture 3 - Discussing the CEO's Problem
- Lecture 4 - From the CEO's Company to Layers in a Network
- Lecture 5 - Layers in Detail
- Lecture 6 - Layered Nature of a Network
- Lecture 7 - Introduction to Internet Data Capturing using Wireshark
- Lecture 8 - Network data captured while requesting a website
- Lecture 9 - What is Cisco Packet Tracer
- Lecture 10 - Modes of Cisco Packet Tracer
- Lecture 11 - Getting Cisco Packet Tracer
- Lecture 12 - Logical and Physical Typologies in Cisco Packet Tracer
- Lecture 13 - Devices on Cisco Packet Tracer
- Lecture 14 - Introduction to the Cisco Packet Tracer Activity for Week 1
- Lecture 15 - Introduction to the campus network on Cisco Packet Tracer
- Lecture 16 - Loading the page in Simulation Mode
- Lecture 17 - Inspecting the packets in Simulation Mode
- Lecture 18 - Editing the dummy website on Cisco Packet Tracer
- Lecture 19 - Summary of the Cisco Packet Tracer Activity
- Lecture 20 - Introduction to Anupam's Adventure
- Lecture 21 - Anupam's adventure brings us to IP Addressing
- Lecture 22 - Addressing at various layers
- Lecture 23 - IP Addresses
- Lecture 24 - Address Translation
- Lecture 25 - Introduction to IP Addressing
- Lecture 26 - Creating a network with Sub-net mask
- Lecture 27 - Nomenclature of a sub-net mask
- Lecture 28 - Network addresses and Private networks
- Lecture 29 - Introduction to the Addressing Topology

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- Lecture 30 - Addressing a local network and DHCP
- Lecture 31 - Addressing a local network manually
- Lecture 32 - Addressing in Public and Private Networks
- Lecture 33 - Verifying Connectivity using Ping
- Lecture 34 - Using network address translation to communicate on internet
- Lecture 35 - Using Sub nets and Summary of addressing
- Lecture 36 - Summary of the week
- Lecture 37 - Analogy for the week 2
- Lecture 38 - Discussion on dabbawala analogy
- Lecture 39 - From dabbawalas to routers and switches
- Lecture 40 - What is routing ?
- Lecture 41 - Static routing in a router in CPT
- Lecture 42 - How does a switch forwards packets CPT
- Lecture 43 - How to add static route in a router? (CPT)
- Lecture 44 - Traveler's dilemma
- Lecture 45 - Discussing the Traveler's dilemma
- Lecture 46 - From Traveler's dilemma to Dynamic Routing
- Lecture 47 - Dynamic Routing with Distance Vector
- Lecture 48 - Distance Vector Routing in Detail
- Lecture 49 - Dynamic Routing with Link State
- Lecture 50 - Setting up dynamic routing in Packet Tracer
- Lecture 51 - Summary of the week
- Lecture 52 - Introduction to analogy for week 3
- Lecture 53 - Analogy for week 3
- Lecture 54 - Questions on analogy for week 3
- Lecture 55 - Understanding the new order requirements
- Lecture 56 - Introduction to Transport Layer
- Lecture 57 - Introduction to TCP
- Lecture 58 - Introduction to UDP
- Lecture 59 - Exploring UDP on Cisco Packet Tracer
- Lecture 60 - TCP Connection Establishment
- Lecture 61 - TCP Connection Closure
- Lecture 62 - Summary of TCP and UDP on Cisco Packet Tracer
- Lecture 63 - The story of the delivery fiasco
- Lecture 64 - From delivery fiasco to Port Numbers
- Lecture 65 - Application Layer in depth
- Lecture 66 - Port number in Wireshark
- Lecture 67 - Summary of port number and PAT
- Lecture 68 - Summary of the entire TCP IP stack

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- Lecture 69 - Introducing the analogy for week 4
- Lecture 70 - The secret box
- Lecture 71 - Questions on analogy for week 4
- Lecture 72 - Secret of the secret box
- Lecture 73 - From secret box to encryption
- Lecture 74 - Introduction to security and CIA
- Lecture 75 - Information Security and Defence in Depth
- Lecture 76 - Information Classification and Access Control
- Lecture 77 - Process Management
- Lecture 78 - Introduction to Network Security
- Lecture 79 - Network Breach and Countermeasures
- Lecture 80 - Internet Security
- Lecture 81 - Securing the Internet Usage
- Lecture 82 - Internet Security Products
- Lecture 83 - Personal Computing Device Recommendations
- Lecture 84 - Responsible Behavior on the Internet
- Lecture 85 - Best practices for home Network and Media Devices
- Lecture 86 - Closing thoughts on security
- Lecture 87 - The story of a family trip
- Lecture 88 - The troubleshooting approach
- Lecture 89 - Troubleshooting Physical and Data Link Layers
- Lecture 90 - Troubleshooting Network Layer
- Lecture 91 - Troubleshooting Transport and Application Layers
- Lecture 92 - Troubleshooting Summary
- Lecture 93 - Troubleshooting Heuristics
- Lecture 94 - Troubleshooting Challenge - 1
- Lecture 95 - Troubleshooting challenge - 2
- Lecture 96 - Troubleshooting Challenge - 3
- Lecture 97 - Thats How we Troubleshoot
- Lecture 98 - Week Summary
- Lecture 99 - Course Closure
- Lecture 100 - Course Credits



# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Multi Disciplinary - NOC:Learning Analytics Tools

Subject Co-ordinator - Prof. Ramkumar Rajendran

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Intro to Data Analytics. What is Learning Analytics?  
Lecture 2 - Academic Analytics, and Educational Data Mining  
Lecture 3 - Four Levels of Analytics  
Lecture 4 - Four Levels of Learning Analytics Overview - II  
Lecture 5 - Data Collection from Different learning environment  
Lecture 6 - Data collection in TELE  
Lecture 7 - Data Preprocessing  
Lecture 8 - Ethics in Learning Analytics, Student Privacy  
Lecture 9 - Demo of Weka  
Lecture 10 - Introduction to Machine Learning - Part 1  
Lecture 11 - Introduction to Machine Learning - Part 2  
Lecture 12 - Training and testing data  
Lecture 13 - Performance Metrics - I  
Lecture 14 - Performance Metrics - II  
Lecture 15 - Performance Metrics - III  
Lecture 16 - Demo of Orange  
Lecture 17 - Descriptive Analytics - I  
Lecture 18 - Descriptive Analytics - II  
Lecture 19 - Charts - I  
Lecture 20 - Charts - II  
Lecture 21 - Charts - III  
Lecture 22 - Comparing Charts  
Lecture 23 - Descriptive Analytics â Example I  
Lecture 24 - Descriptive Analytics â Example II  
Lecture 25 - Excel tool  
Lecture 26 - Diagnostics Analytics  
Lecture 27 - Correlation  
Lecture 28 - Correlation Matrix  
Lecture 29 - Spearmanâ s Rank Correlation

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- Lecture 30 - Data Mining
- Lecture 31 - iSAT
- Lecture 32 - Diagnostic Analytics - SPM
- Lecture 33 - Sequential pattern mining (SPM-II)
- Lecture 34 - Differential Sequence Mining (DSM)
- Lecture 35 - Process Mining
- Lecture 36 - Diagnostic Analytics - Clustering
- Lecture 37 - K-means Clustering
- Lecture 38 - Hierarchical Clustering
- Lecture 39 - Clustering - Examples
- Lecture 40 - Predictive Analytics
- Lecture 41 - Linear Regression
- Lecture 42 - Multiple Regression
- Lecture 43 - Logistic Regression
- Lecture 44 - Linear Regression - Example
- Lecture 45 - Predictive Analytics - II
- Lecture 46 - Naive Bayes Classifier
- Lecture 47 - Decision Tree
- Lecture 48 - Decision Tree Classifier
- Lecture 49 - DT, NB - Examples
- Lecture 50 - Text Analytics
- Lecture 51 - Introduction to NLP
- Lecture 52 - NLP-II
- Lecture 53 - NLP-Tools
- Lecture 54 - NLP-Examples
- Lecture 55 - Intro Multimodal Learning Analytics
- Lecture 56 - Affective Computing - 1
- Lecture 57 - Affective Computing - 2
- Lecture 58 - Eye Tracking
- Lecture 59 - Revision of Learning Analytics tools course
- Lecture 60 - Source of Data collection and Research Community
- Lecture 61 - Machine Learning tools used in industry

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Design and Engineering of Computer Systems

Subject Co-ordinator - Prof. Mythili Vutukuru

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Computer Systems  
Lecture 2 - Principles of Computer Systems Design  
Lecture 3 - Overview of CPU hardware  
Lecture 4 - Overview of memory and I/O hardware  
Lecture 5 - Introduction to Operating Systems  
Lecture 6 - Week 1: Tutorial 1  
Lecture 7 - Week 1: Tutorial 2  
Lecture 8 - Processes  
Lecture 9 - Kernel mode execution  
Lecture 10 - Threads  
Lecture 11 - CPU scheduling policies  
Lecture 12 - Virtual machines and containers  
Lecture 13 - Week 2: Tutorial 1  
Lecture 14 - Week 2: Tutorial 2  
Lecture 15 - Week 2: Tutorial 3  
Lecture 16 - Memory management in OS  
Lecture 17 - Paging  
Lecture 18 - Demand paging  
Lecture 19 - File system and memory  
Lecture 20 - Optimizing memory access  
Lecture 21 - Week 3: Tutorial 1  
Lecture 22 - Week 3: Tutorial 2  
Lecture 23 - Week 3: Tutorial 3  
Lecture 24 - Filesystem Datastructures  
Lecture 25 - Filesystem Implementation  
Lecture 26 - Network I/O via Sockets  
Lecture 27 - Network I/O Implementation  
Lecture 28 - Memory and I/O virtualization  
Lecture 29 - Week 4: Tutorial 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Week 4: Tutorial 2
- Lecture 31 - Introduction to computer networking
- Lecture 32 - Internet Routing and Forwarding
- Lecture 33 - Transport protocols
- Lecture 34 - Application layer protocols
- Lecture 35 - Network Security
- Lecture 36 - Week 5: Tutorial 1
- Lecture 37 - Week 5: Tutorial 2
- Lecture 38 - Multithreaded application design
- Lecture 39 - Inter-process communication
- Lecture 40 - Multi-tier application design
- Lecture 41 - Examples of end-to-end systems design
- Lecture 42 - Deployment of computer systems
- Lecture 43 - Week 6: Tutorial 1
- Lecture 44 - Week 6: Tutorial 2
- Lecture 45 - Performance measurement
- Lecture 46 - Performance analysis
- Lecture 47 - Performance profiling and optimization
- Lecture 48 - Caching
- Lecture 49 - Performance scalability
- Lecture 50 - Week 7: Tutorial 1
- Lecture 51 - Fault tolerance and reliability
- Lecture 52 - Replication and consistency
- Lecture 53 - Atomicity
- Lecture 54 - Distributed transactions
- Lecture 55 - Case studies of distributed systems design

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Software Conceptual Design

Subject Co-ordinator - Prof. Sridhar Iyer, Prof. Prajish Prasad, Prof. T. G. Lakshmi

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1  
Lecture 2  
Lecture 3  
Lecture 4  
Lecture 5  
Lecture 6  
Lecture 7  
Lecture 8  
Lecture 9  
Lecture 10  
Lecture 11  
Lecture 12  
Lecture 13  
Lecture 14  
Lecture 15  
Lecture 16  
Lecture 17  
Lecture 18  
Lecture 19  
Lecture 20  
Lecture 21  
Lecture 22  
Lecture 23  
Lecture 24  
Lecture 25

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Game Theory and Mechanism Design

Subject Co-ordinator - Prof. Swaprava Nath

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction: Game Theory
- Lecture 2 - Introduction: Mechanism Design
- Lecture 3 - The game of chess
- Lecture 4 - Proof of the chess theorem
- Lecture 5 - Normal form games
- Lecture 6 - Dominance
- Lecture 7 - Nash equilibrium
- Lecture 8 - Maxmin strategies
- Lecture 9 - Elimination of dominated strategies
- Lecture 10 - Preservation of PSNE
- Lecture 11 - Matrix games
- Lecture 12 - Relation between Maxmin and PSNE in matrix
- Lecture 13 - Mixed strategies
- Lecture 14 - Mixed strategy Nash equilibrium (MSNE)
- Lecture 15 - Find MSNE
- Lecture 16 - MSNE characterization theorem proof
- Lecture 17 - Algorithm to find MSNE
- Lecture 18 - Correlated equilibrium (CE)
- Lecture 19 - Computing correlated equilibrium
- Lecture 20 - Extensive form games
- Lecture 21 - Subgame perfection
- Lecture 22 - Limitations of SPNE
- Lecture 23 - Imperfect Information Extensive Form Games (IIEFG)
- Lecture 24 - Strategies in IIEFGs
- Lecture 25 - Equivalence of Strategies in IIEFGs
- Lecture 26 - Perfect Recall
- Lecture 27 - Equilibrium in IIEFG
- Lecture 28 - Game Theory in Practice: P2P file sharing
- Lecture 29 - Bayesian Games

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Strategy, Utility in Bayesian Games
- Lecture 31 - Equilibrium in Bayesian Games
- Lecture 32 - Examples of Bayesian Equilibrium
- Lecture 33 - Introduction to Mechanism Design
- Lecture 34 - Revelation Principle
- Lecture 35 - Introduction to Arrow's Impossibility Result
- Lecture 36 - Proof of Arrow's Result
- Lecture 37 - Introduction to the Social Choice Setup
- Lecture 38 - Introduction to Gibbard-Satterthwaite Theorem
- Lecture 39 - Proof of Gibbard-Satterthwaite Theorem
- Lecture 40 - Domain Restriction
- Lecture 41 - Median Voting Rule
- Lecture 42 - Median Voter Theorem - Part 1
- Lecture 43 - Median Voter Theorem - Part 2
- Lecture 44 - The Task Sharing Domain
- Lecture 45 - The Uniform Rule
- Lecture 46 - Mechanism Design with Transfers
- Lecture 47 - Examples of Quasi-linear Preferences
- Lecture 48 - Pareto Optimality and Groves Payments
- Lecture 49 - Introduction to VCG Mechanism
- Lecture 50 - VCG in Combinatorial Allocations
- Lecture 51 - Applications to Internet Advertising
- Lecture 52 - Slot Allocation and Payments in Position
- Lecture 53 - Pros and Cons of VCG Mechanism
- Lecture 54 - Affine Maximizers
- Lecture 55 - Single Object Allocation
- Lecture 56 - Myerson's Lemma
- Lecture 57 - Illustration of Myerson's Lemma
- Lecture 58 - Optimal Mechanism Design
- Lecture 59 - Single Agent Optimal Mechanism Design
- Lecture 60 - Multiple Agent Optimal Mechanism Design
- Lecture 61 - Examples of Optimal Mechanisms
- Lecture 62 - Endnotes and Summary

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Computer and Network Performance

Subject Co-ordinator - Prof. Varsha Apte

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction, why do delays happen, contention for resources
- Lecture 2 - Performance metrics and parameters
- Lecture 3 - Introducing Queuing Systems
- Lecture 4 - Memoryless Distributions
- Lecture 5 - Operational Laws
- Lecture 6 - Asymptotic Analysis of G/G/1, G/G/1/K queues
- Lecture 7 - Asymptotic Analysis of G/G/c/K queues
- Lecture 8 - Little's Law
- Lecture 9 - Little's Law examples and A Case Study of Open Load test on a Web server
- Lecture 10 - Some results for M/G/1 queue and Memoryless Arrivals
- Lecture 11 - Continuing the Case Study of Open Load test on a web server (Response Time)
- Lecture 12 - Open queuing networks - tandem queuing network
- Lecture 13 - Open queuing networks - general (Jackson) queuing networks
- Lecture 14 - Open queuing networks - examples
- Lecture 15 - Closed Queuing Systems
- Lecture 16 - Closed Queuing System (Continued...)
- Lecture 17 - Case study of Closed Load Test on a Web Server
- Lecture 18 - General formulation of Jacksonian Closed Queuing Networks
- Lecture 19 - Mean Value Analysis for Closed Queuing Networks
- Lecture 20 - Mean Value Analysis examples, Case Study of a Load test on a web server, Closing Remarks

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Games and Information

Subject Co-ordinator - Prof. Ankur A. Kulkarni

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction, why do delays happen, contention for resources
- Lecture 2 - Performance metrics and parameters
- Lecture 3 - Introducing Queuing Systems
- Lecture 4 - Memoryless Distributions
- Lecture 5 - Operational Laws
- Lecture 6 - Aumann model of incomplete information: Definition and Examples
- Lecture 7 - Knowledge operator: Definition and Examples
- Lecture 8 - Common knowledge: Definition and Examples
- Lecture 9 - The structural theorem of common knowledge
- Lecture 10 - Proof of the structural theorem (forward direction)
- Lecture 11 - Proof of the structural theorem (backward direction)
- Lecture 12 - Aumann model of incomplete information with belief: Definition and Examples
- Lecture 13 - Aumann's agreement theorem
- Lecture 14 - Zero-sum game definition and Security strategies
- Lecture 15 - Saddle point strategies
- Lecture 16 - Further properties of saddle point strategies
- Lecture 17 - Mixed strategies
- Lecture 18 - Weierstrass lemma and existence of a mixed saddle point strategy
- Lecture 19 - Von Neumann minmax theorem
- Lecture 20 - Computing mixed saddle point strategy: Holmes and Moriarty
- Lecture 21 - Computing mixed strategy saddle point: 2X2 matrix game
- Lecture 22 - Computing mixed strategy saddle point: 2X3 matrix game
- Lecture 23 - Nash equilibrium of a non zero-sum game and its relation with Kakutani fixed
- Lecture 24 - Proof: Existence of Nash equilibrium (Condition 1 of Kakutani fixed point)
- Lecture 25 - Proof: Existence of Nash equilibrium (Condition 2 of Kakutani fixed point)
- Lecture 26 - Existence of Nash equilibrium for infinite strategy space (Using Brouwer's)
- Lecture 27 - Quantal Response: Motivation
- Lecture 28 - Quantal Response: Formal model
- Lecture 29 - Dynamic games definition

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Solution concept in dynamic games
- Lecture 31 - Relation of the heuristic solution with the Nash equilibrium of the standard
- Lecture 32 - Example of a Threat equilibrium
- Lecture 33 - Interpreting the threat equilibrium in standard normal form of the dynamic game
- Lecture 34 - Extensive form games - I
- Lecture 35 - Extensive form games - II
- Lecture 36 - Single Act Games
- Lecture 37 - Informationally inferior games
- Lecture 38 - Information Structure in Single Act Games
- Lecture 39 - Nested and Ladder Nested Extensive form games
- Lecture 40 - Equilibrium Algorithm
- Lecture 41 - Stage-wise multi act games
- Lecture 42 - Feedback equilibrium
- Lecture 43 - Mixed and Behavioral Strategies
- Lecture 44 - Conditions for equivalence for mixed and behavioral strategies
- Lecture 45 - Kuhn's Theorem - I
- Lecture 46 - Kuhn's Theorem - II
- Lecture 47 - Kuhn's Theorem - III
- Lecture 48 - Games of incomplete information
- Lecture 49 - Bayesian Nash equilibrium - I
- Lecture 50 - Bayesian Nash equilibrium - II
- Lecture 51 - Self-enforcement of Nash equilibrium
- Lecture 52 - Stackelberg game
- Lecture 53 - Principal-Agent Models - I
- Lecture 54 - Principal-Agent Models - II
- Lecture 55 - Moral Hazard and Adverse selection
- Lecture 56 - Games with contracts
- Lecture 57 - Correlated Equilibrium - I
- Lecture 58 - Correlated Equilibrium - II
- Lecture 59 - Correlated Equilibrium - III
- Lecture 60 - Bayesian Game with mediated communication
- Lecture 61 - Revelation Principle

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Distributed Optimization and Machine Learning

Subject Co-ordinator - Prof. Mayank Baranwal

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to optimization
- Lecture 2 - Analyzing optimization algorithms in continuous time domain
- Lecture 3 - Course Outline
- Lecture 4 - Basics of optimization problems
- Lecture 5 - Convex sets and Convex functions
- Lecture 6 - Strictly and strongly convex functions
- Lecture 7 - Implications of strong convexity
- Lecture 8 - Primal and dual optimization problems
- Lecture 9 - Slaters condition
- Lecture 10 - Analysis of gradient descent algorithm
- Lecture 11 - KKT conditions
- Lecture 12 - Acceleration under strong convexity
- Lecture 13 - Accelerate the convergence even further
- Lecture 14 - Stability theory
- Lecture 15 - Connections to optimization problems
- Lecture 16 - Exponential stability
- Lecture 17 - Bregman Divergence
- Lecture 18 - Rescaled Gradient Flow
- Lecture 19 - Advanced Results on PL inequality - Part 1
- Lecture 20 - Advanced Results on PL inequality - Part 2
- Lecture 21 - Constrained Optimization Problem
- Lecture 22 - Augmented Lagrangian
- Lecture 23 - Method of Multipliers
- Lecture 24 - Dual Ascent and Dual Decomposition
- Lecture 25 - ADMM Algorithm
- Lecture 26 - Basics of Graph Theory - 1
- Lecture 27 - Basics of Graph Theory - 2
- Lecture 28 - Consensus and Average Consensus - 1
- Lecture 29 - Consensus and Average Consensus - 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Consensus Algorithms
- Lecture 31 - Consensus Algorithms - Fixed time
- Lecture 32 - Distributed Economic Dispatch Problem
- Lecture 33 - Algorithm for Uncapacitated EDP
- Lecture 34 - Capacitated EDP
- Lecture 35 - Algorithms for Distributed Optimization - 1
- Lecture 36 - Algorithms for Distributed Optimization - 2
- Lecture 37 - Continuous-time Distributed Optimization Algorithms
- Lecture 38 - Introduction to Neural Networks
- Lecture 39 - Large Scale Machine Learning
- Lecture 40 - Decentralized Stochastic Gradient Descent - 1
- Lecture 41 - Decentralized Stochastic Gradient Descent - 2
- Lecture 42 - Introduction to Federated Learning
- Lecture 43 - FedAvg Algorithm
- Lecture 44 - Convergence Analysis of FL
- Lecture 45 - Sources of Computational Heterogeneity in FL
- Lecture 46 - Objective Inconsistency Problem
- Lecture 47 - General Update Rule

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Computational Geometry

Subject Co-ordinator - Prof. Sandeep Sen

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Visibility Problems
- Lecture 3 - 2D Maxima
- Lecture 4 - Line Sweep Method
- Lecture 5 - Segment Intersection Problem
- Lecture 6 - Line Sweep
- Lecture 7 - Convex Hull
- Lecture 8 - Convex Hull Contd
- Lecture 9 - Quick Hull
- Lecture 10 - More Convex Hull Algorithms
- Lecture 11 - Intersection of Half Planes and Duality
- Lecture 12 - Intersection of Half Planes and Duality Contd
- Lecture 13 - Lower Bounds
- Lecture 14 - Planar Point Location
- Lecture 15 - Point Location and Triangulation Contd...
- Lecture 16 - Triangulation of Arbitrary Polygon
- Lecture 17 - Voronoi Diagram
- Lecture 18 - Voronoi Diagram Construction
- Lecture 19 - Delaunay Triangulation
- Lecture 20 - Quick sort and Backward Analysis
- Lecture 21 - Generalized RIC
- Lecture 22 - RIC Continued
- Lecture 23 - Arrangements
- Lecture 24 - Zone Theorem and Application
- Lecture 25 - Levels
- Lecture 26 - Range Searching
- Lecture 27 - Orthogonal Range searching
- Lecture 28 - Priority Search Trees
- Lecture 29 - Non - Orthogonal Range Searching

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Half - Plane Range Query
- Lecture 31 - Well Separated Partitioning
- Lecture 32 - Quadtrees Epsilon -WSPD
- Lecture 33 - Construction of Epsilon - WSPD
- Lecture 34 - Epsilon - WSPD to Geometric Spanner
- Lecture 35 - Epsilon-Nets & VC Dimension
- Lecture 36 - Epsilon-Nets & VC Dimension contd
- Lecture 37 - Geometric Set Cover
- Lecture 38 - Geometric Set Cover (with Bounded VC Dimension)
- Lecture 39 - Shape Representation
- Lecture 40 - Shape Comparison

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Logic for CS

Subject Co-ordinator - Prof. S. Arun Kumar

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Propositional Logic Syntax  
Lecture 3 - Semantics of Propositional Logic  
Lecture 4 - Logical and Algebraic Concepts  
Lecture 5 - Identities and Normal forms  
Lecture 6 - Tautology Checking  
Lecture 7 - Propositional Unsatisfiability  
Lecture 8 - Analytic Tableaux  
Lecture 9 - Consistency and Completeness  
Lecture 10 - The Completeness Theorem  
Lecture 11 - Maximally Consistent Sets  
Lecture 12 - Formal Theories  
Lecture 13 - Proof Theory  
Lecture 14 - Derived Rules  
Lecture 15 - The Hilbert System  
Lecture 16 - The Hilbert System  
Lecture 17 - Introduction to Predicate Logic  
Lecture 18 - The Semantic of Predicate Logic  
Lecture 19 - Substitutions  
Lecture 20 - Models  
Lecture 21 - Structures and Substructures  
Lecture 22 - First-Order Theories  
Lecture 23 - Predicate Logic  
Lecture 24 - Existential Quantification  
Lecture 25 - Normal Forms  
Lecture 26 - Skolemization  
Lecture 27 - Substitutions and Instantiations  
Lecture 28 - Unification  
Lecture 29 - Resolution in FOL

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - More on Resolution in FOL
- Lecture 31 - Resolution
- Lecture 32 - Resolution and Tableaux
- Lecture 33 - Completeness of Tableaux Method
- Lecture 34 - Completeness of the Hilbert System
- Lecture 35 - First-Order Theories
- Lecture 36 - Towards Logic Programming
- Lecture 37 - Verification of Imperative Programs
- Lecture 38 - Verification of WHILE Programs
- Lecture 39 - References



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Computer Architecture (Prof. Anshul Kumar)

Subject Co-ordinator - Prof. Anshul Kumar

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Computer Architecture
- Lecture 2 - History of Computers
- Lecture 3 - Instruction Set Architecture - I
- Lecture 4 - Instruction Set Architecture - II
- Lecture 5 - Instruction Set Architecture - III
- Lecture 6 - Recursive Programs
- Lecture 7 - Architecture Space
- Lecture 8 - Architecture Examples
- Lecture 9 - Performance
- Lecture 10 - Performance
- Lecture 11 - Binary Arithmetic, ALU Design
- Lecture 12 - ALU Design, Overflow
- Lecture 13 - Multiplier Design
- Lecture 14 - Divider Design
- Lecture 15 - Fast Addition , Multiplication
- Lecture 16 - Floating Point Arithmetic
- Lecture 17 - Processor Design - Introduction
- Lecture 18 - Processor Design
- Lecture 19 - Processor Design - Simple Design
- Lecture 20 - Processor Design - Multi Cycle Approach
- Lecture 21 - Processor Design - Control for Multi Cycle
- Lecture 22 - Processor Design - Micro programmed Control
- Lecture 23 - Processor Design - Exception Handling
- Lecture 24 - Pipelined Processor Design Basic Idea
- Lecture 25 - Pipelined Processor Design
- Lecture 26 - Pipelined Processor Design
- Lecture 27 - Pipelined Processor Design
- Lecture 28 - Memory Hierarchy
- Lecture 29 - Memory Hierarchy

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Memory Hierarchy
- Lecture 31 - Memory Hierarchy
- Lecture 32 - Memory Hierarchy
- Lecture 33 - Input / Output Subsystem
- Lecture 34 - Input / Output Subsystem
- Lecture 35 - Input / Output Subsystem
- Lecture 36 - Input / Output Subsystem
- Lecture 37 - Input / Output Subsystem
- Lecture 38 - Concluding Remarks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Data Structures And Algorithms

Subject Co-ordinator - Prof. Naveen Garg

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Data Structures and Algorithms

Lecture 2 - Stacks

Lecture 3 - Queues and Linked Lists

Lecture 4 - Dictionaries

Lecture 5 - Hashing

Lecture 6 - Trees

Lecture 7 - Tree Walks / Traversals

Lecture 8 - Ordered Dictionaries

Lecture 9 - Deletion

Lecture 10 - Quick Sort

Lecture 11 - AVL Trees

Lecture 12 - AVL Trees

Lecture 13 - Trees

Lecture 14 - Red Black Trees

Lecture 15 - Insertion in Red Black Trees

Lecture 16 - Disk Based Data Structures

Lecture 17 - Case Study

Lecture 18 - Tries

Lecture 19 - Data Compression

Lecture 20 - Priority Queues

Lecture 21 - Binary Heaps

Lecture 22 - Why Sorting

Lecture 23 - More Sorting

Lecture 24 - Graphs

Lecture 25 - Data Structures for Graphs

Lecture 26 - Two Applications of Breadth First Search

Lecture 27 - Depth First Search

Lecture 28 - Applications of DFS

Lecture 29 - DFS in Directed Graphs

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Applications of DFS in Directed Graphs
- Lecture 31 - Minimum Spanning Trees
- Lecture 32 - The Union
- Lecture 33 - Prims Algorithm for Minimum Spanning Trees
- Lecture 34 - Single Source Shortest Paths
- Lecture 35 - Correctness of Dijkstras Algorithm
- Lecture 36 - Single Source Shortest Paths

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Introduction to Computer Graphics

Subject Co-ordinator - Prof. Prem K Kalra

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Raster Graphics  
Lecture 3 - Raster Graphics (Continued...)  
Lecture 4 - Clipping  
Lecture 5 - Polygon Clipping and Polygon Scan Conversion  
Lecture 6 - Transformations  
Lecture 7 - Transformations (Continued...)  
Lecture 8 - 3D Viewing  
Lecture 9 - 3D Viewing (Continued...)  
Lecture 10 - Curves  
Lecture 11 - Assignment - I  
Lecture 12 - Curves (Continued...)  
Lecture 13 - Curves (Continued...)  
Lecture 14 - Curves (Continued...)  
Lecture 15 - Curves (Continued...)  
Lecture 16 - Surfaces  
Lecture 17 - Surfaces (Continued...)  
Lecture 18 - Surfaces (Continued...)  
Lecture 19 - Surfaces (Continued...)  
Lecture 20 - Hierarchical Models  
Lecture 21 - Rendering  
Lecture 22 - Rendering (Continued...)  
Lecture 23 - Rendering (Continued...)  
Lecture 24 - Ray Tracing  
Lecture 25 - Ray Tracing (Continued...)  
Lecture 26 - Ray Tracing (Continued...)  
Lecture 27 - Assignment  
Lecture 28 - Hidden Surface Elimination  
Lecture 29 - Hidden Surface Elimination (Continued...)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Hidden Surface Elimination (Continued...)
- Lecture 31 - Fractals
- Lecture 32 - Fractals (Continued...)
- Lecture 33 - Computer Animation
- Lecture 34 - Animation (Continued...)
- Lecture 35 - Animation (Continued...)

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Principles of Programming Languages

Subject Co-ordinator - Prof. S. Arun Kumar

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Syntax  
Lecture 3 - Grammars  
Lecture 4 - Ambiguity  
Lecture 5 - PLO  
Lecture 6 - Semantics  
Lecture 7 - Syntactic Classes  
Lecture 8 - Transition Systems  
Lecture 9 - PLO  
Lecture 10 - Binding  
Lecture 11 - Environments  
Lecture 12 - Declarations  
Lecture 13 - Commands  
Lecture 14 - Stores  
Lecture 15 - Summary  
Lecture 16 - Declarations and Commands  
Lecture 17 - Blocks  
Lecture 18 - Qualification  
Lecture 19 - Pragmatics  
Lecture 20 - Data  
Lecture 21 - Structured Data  
Lecture 22 - Sequences  
Lecture 23 - Control  
Lecture 24 - Non-Determinacy  
Lecture 25 - Programming Languages  
Lecture 26 - Programming Languages  
Lecture 27 - Programming Languages  
Lecture 28 - Data as Functions  
Lecture 29 - Data and Fixpoints

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Normal Forms
- Lecture 31 - Programming Languages
- Lecture 32 - Monomorphism
- Lecture 33 - Polymorphism
- Lecture 34 - Type Checking
- Lecture 35 - Contexts
- Lecture 36 - Abstracts
- Lecture 37 - Procedures
- Lecture 38 - Meanings
- Lecture 39 - Parameters
- Lecture 40 - The Future



# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Parallel Computing

Subject Co-ordinator - Dr. Subodh Kumar

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Parallel Programming Paradigms
- Lecture 3 - Parallel Architecture
- Lecture 4 - Parallel Architecture (case studies)
- Lecture 5 - Open MP
- Lecture 6 - Open MP (Continued.)
- Lecture 7 - Open MP (Continued..)
- Lecture 8 - Open MP & PRAM Model of Computation
- Lecture 9 - PRAM
- Lecture 10 - Models of Parallel Computation, Complexity
- Lecture 11 - Memory Consistency
- Lecture 12 - Memory Consistency & Performance Issues
- Lecture 13 - Parallel Program Design
- Lecture 14 - Shared Memory & Message Passing
- Lecture 15 - MPI
- Lecture 16 - MPI (Continued.)
- Lecture 17 - MPI (Continued..)
- Lecture 18 - Algorithmic Techniques
- Lecture 19 - Algorithmic Techniques (Continued.)
- Lecture 20 - Algorithmic Techniques (Continued..)
- Lecture 21 - CUDA
- Lecture 22 - CUDA (Continued.)
- Lecture 23 - CUDA (Continued..)
- Lecture 24 - CUDA (Continued...)
- Lecture 25 - CUDA (Continued....)
- Lecture 26 - CUDA (Continued.....)
- Lecture 27 - CUDA (Continued.....)
- Lecture 28 - Algorithms, Merging & Sorting
- Lecture 29 - Algorithms, Merging & Sorting (Continued.)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Algorithms, Merging & Sorting (Continued..)
- Lecture 31 - Algorithms, Merging & Sorting (Continued...)
- Lecture 32 - Algorithms, Merging & Sorting (Continued....)
- Lecture 33 - Lower Bounds Lock Free Synchronization, Load Stealing
- Lecture 34 - Lock Free Synchronization, Graph Algorithms

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Operating Systems

Subject Co-ordinator - Prof. Sorav Bansal

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introductio to UNIX System Calls - Part 1

Lecture 2 - Introductio to UNIX System Calls - Part 2

Lecture 3 - Threads, Address Spaces, Filesystem Devices

Lecture 4 - PC Architecture

Lecture 5 - x86 Instruction Set, GCC Calling Conventions

Lecture 6 - Physical Memory Map, I/O, Segmentation

Lecture 7 - Segmentation, Trap Handling

Lecture 8 - Traps, Trap Handlers

Lecture 9 - Kernel Data Structures, Memory Management

Lecture 10 - Segmentation Review, Introduction to Paging

Lecture 11 - Paging

Lecture 12 - Process Address Spaces Using Paging

Lecture 13 - Translation Lookaside Buffer, Large Pages, Boot Sector

Lecture 14 - Loading the kernel, Initializing the Page table

Lecture 15 - Setting up page tables for user processes

Lecture 16 - Processes in action

Lecture 17 - Process structure, Context Switching

Lecture 18 - Process Kernel stack, Scheduler, Fork, Context-Switch, Process Control Block, Trap Entry and Return

Lecture 19 - Creating the first process

Lecture 20 - Handling User Pointers, Concurrency

Lecture 21 - Locking

Lecture 22 - Fine-grained Locking and its challenges

Lecture 23 - Locking variations

Lecture 24 - Condition variables

Lecture 25 - Multiple producer, multiple consumer queue; semaphores; monitors

Lecture 26 - Transactions and lock-free primitives read/write locks

Lecture 27 - Synchronization in xv6

Lecture 28 - More synchronization in xv6

Lecture 29 - Demand Paging; Introduction to Page Replacement

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Page Replacement, Thrashing
- Lecture 31 - Storage Devices, Filesystem Interfaces
- Lecture 32 - File System Implementation
- Lecture 33 - File System Operation
- Lecture 34 - Cache Recovery and Logging
- Lecture 35 - Logging in Linux ext3 filesystem
- Lecture 36 - Protection and Security
- Lecture 37 - Scheduling Policies
- Lecture 38 - Lock-free multiprocessor coordination, Read-Copy-Update
- Lecture 39 - Microkernel, Exokernel, Multikernel
- Lecture 40 - Virtualization, Cloud Computing, Technology Trends

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computer Architecture (2017)

Subject Co-ordinator - Prof. Smruti R.Sarangi

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Computer Architecture  
Lecture 2 - The Language of Bits - Part-I  
Lecture 3 - The Language of Bits - Part-II  
Lecture 4 - The Language of Bits - Part-III  
Lecture 5 - Assembly Language - Part-I  
Lecture 6 - Assembly Language - Part-II  
Lecture 7 - Assembly Language - Part-III  
Lecture 8 - ARM Assembly Language - Part-I  
Lecture 9 - ARM Assembly Language - Part-II  
Lecture 10 - x86 Assembly Language - Part-I  
Lecture 11 - x86 Assembly Language - Part-II  
Lecture 12 - x86 Assembly Language - Part-III  
Lecture 13 - x86 Assembly Language - Part-IV  
Lecture 14 - A Primer on Digital Logic - Part-I  
Lecture 15 - A Primer on Digital Logic - Part-II  
Lecture 16 - A Primer on Digital Logic - Part-III  
Lecture 17 - Computer Arithmetic - Part-I  
Lecture 18 - Computer Arithmetic - Part-II  
Lecture 19 - Computer Arithmetic - Part-III  
Lecture 20 - Computer Arithmetic - Part-IV  
Lecture 21 - Computer Arithmetic - Part-V  
Lecture 22 - Computer Arithmetic - Part-VI  
Lecture 23 - Processor Design - Part-I  
Lecture 24 - Processor Design - Part-II  
Lecture 25 - Processor Design - Part-III  
Lecture 26 - Principles of Pipelining - Part-I  
Lecture 27 - Principles of Pipelining - Part-II  
Lecture 28 - Principles of Pipelining - Part-III  
Lecture 29 - Principles of Pipelining - Part-IV

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - The Memory Systems - Part-I
- Lecture 31 - The Memory Systems - Part-II
- Lecture 32 - The Memory Systems - Part-III
- Lecture 33 - The Memory Systems - Part-IV

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Parallel Programming in OpenMP

Subject Co-ordinator - Dr. Yogish Sabharwal

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Parallel Programming
- Lecture 2 - Parallel Architectures and Programming Models
- Lecture 3 - Pipelining
- Lecture 4 - Superpipelining and VLIW
- Lecture 5 - Memory Latency
- Lecture 6 - Cache and Temporal Locality
- Lecture 7 - Cache, Memory bandwidth and Spatial Locality
- Lecture 8 - Intuition for Shared and Distributed Memory architectures
- Lecture 9 - Shared and Distributed Memory architectures
- Lecture 10 - Interconnection networks in Distributed Memory architectures
- Lecture 11 - OpenMP: A parallel Hello World Program
- Lecture 12 - Program with Single thread
- Lecture 13 - Program Memory with Multiple threads and Multi-tasking
- Lecture 14 - Context Switching
- Lecture 15 - OpenMP: Basic thread functions
- Lecture 16 - OpenMP: About OpenMP
- Lecture 17 - Shared Memory Consistency Models and the Sequential Consistency Model
- Lecture 18 - Race Conditions
- Lecture 19 - OpenMP: Scoping variables and some race conditions
- Lecture 20 - OpenMP: thread private variables and more constructs
- Lecture 21 - Computing sum: first attempt at parallelization
- Lecture 22 - Manual distribution of work and critical sections
- Lecture 23 - Distributing for loops and reduction
- Lecture 24 - Vector-Vector operations (Dot product)
- Lecture 25 - Matrix-Vector operations (Matrix-Vector Multiply)
- Lecture 26 - Matrix-Matrix operations (Matrix-Matrix Multiply)
- Lecture 27 - Introduction to tasks
- Lecture 28 - Task queues and task execution
- Lecture 29 - Accessing variables in tasks

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Completion of tasks and scoping variables in tasks
- Lecture 31 - Recursive task spawning and pitfalls
- Lecture 32 - Understanding LU Factorization
- Lecture 33 - Parallel LU Factorization
- Lecture 34 - Locks
- Lecture 35 - Advanced Task handling
- Lecture 36 - Matrix Multiplication using tasks
- Lecture 37 - The OpenMP Shared Memory Consistency Model
- Lecture 38 - Applications finite element method
- Lecture 39 - Applications deep learning
- Lecture 40 - Introduction to MPI and basic calls
- Lecture 41 - MPI calls to send and receive data
- Lecture 42 - MPI calls for broadcasting data
- Lecture 43 - MPI non blocking calls
- Lecture 44 - Application distributed histogram updation
- Lecture 45 - MPI collectives and MPI broadcast
- Lecture 46 - MPI gathering and scattering collectives
- Lecture 47 - MPI reduction and alltoall collectives
- Lecture 48 - Discussion on MPI collectives design
- Lecture 49 - Characterization of interconnects
- Lecture 50 - Linear arrays 2D mesh and torus
- Lecture 51 - d dimensional torus
- Lecture 52 - Hypercube
- Lecture 53 - Trees and cliques
- Lecture 54 - Hockney model
- Lecture 55 - Broadcast and Reduce with recursive doubling
- Lecture 56 - Scatter and Gather with recursive doubling
- Lecture 57 - Reduce scatter and All gather with recursive doubling
- Lecture 58 - Discussion of message sizes in analysis
- Lecture 59 - Revisiting Reduce scatter on 2D mesh
- Lecture 60 - Reduce scatter and Allreduce on the Hypercube
- Lecture 61 - Alltoall on the Hypercube
- Lecture 62 - Lower bounds
- Lecture 63 - Pipeline based algorithm for Allreduce
- Lecture 64 - An improved algorithm for Alltoall on the Hypercube using E-cube routing
- Lecture 65 - Pipeline based algorithm for Broadcast
- Lecture 66 - Introduction to parallel graph algorithms
- Lecture 67 - Breadth First Search BFS using matrix algebra
- Lecture 68 - BFS Shared memory parallelization using OpenMP

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Distributed memory settings and data distribution
- Lecture 70 - Distributed BFS algorithm
- Lecture 71 - Performance considerations
- Lecture 72 - Prims Algorithm
- Lecture 73 - OpenMP based shared memory parallelization for MST
- Lecture 74 - MPI based distributed memory parallelization for MST
- Lecture 75 - Sequential Algorithm Adaptation from Prims
- Lecture 76 - Parallelization Strategy for Prims algorithm
- Lecture 77 - Dry run with the parallel strategy
- Lecture 78 - Johnsons algorithm with 1D data distribution
- Lecture 79 - Speedup analysis on a grid graph
- Lecture 80 - Floyd's algorithm for all pair shortest paths
- Lecture 81 - Floyd's algorithm with 2D data distribution
- Lecture 82 - Adaptation to transitive closures
- Lecture 83 - Parallelization strategy for connected components
- Lecture 84 - Analysis for parallel connected components

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Synthesis of Digital Systems

Subject Co-ordinator - Prof. Preeti Ranjan Panda

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Outline - What is Synthesis?
- Lecture 2 - Chip Design Flow and Hardware Modelling
- Lecture 3 - VHDL
- Lecture 4 - VHDL
- Lecture 5 - VHDL
- Lecture 6 - VHDL
- Lecture 7 - Introduction to High-level Synthesis
- Lecture 8 - Language front-end Design Representation
- Lecture 9 - Compiler Transformation in High Level Synthesis
- Lecture 10 - Memory Modelling and Compiler Transformation in High Level Synthesis
- Lecture 11 - Compiler Transformations in High Level Synthesis
- Lecture 12 - Hardware Transformations and ASAP / ALAP Scheduling
- Lecture 13 - Scheduling in High Level Synthesis
- Lecture 14 - Force Directed Scheduling and Register Allocation
- Lecture 15 - High Level Synthesis and Timing Issues
- Lecture 16 - Finite State Machine Synthesis
- Lecture 17 - Finite State Machine Synthesis
- Lecture 18 - The Retiming Problem
- Lecture 19 - Efficient Solution to Retiming and Introduction to Logic Synthesis
- Lecture 20 - Binary Decision Diagrams
- Lecture 21 - Introduction to Logic Synthesis
- Lecture 22 - Two-level Logic Optimisation
- Lecture 23 - Multi-Level Logic Optimisation
- Lecture 24 - Multi-level Logic Synthesis
- Lecture 25 - Introduction to Timing Analysis
- Lecture 26 - Timing Analysis and Critical Paths

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:An Introduction to Artificial Intelligence

Subject Co-ordinator - Prof. Mausam

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Introduction  
Lecture 3 - Introduction  
Lecture 4 - Introduction  
Lecture 5 - Introduction  
Lecture 6 - Introduction  
Lecture 7 - Introduction  
Lecture 8 - Introduction  
Lecture 9 - Introduction  
Lecture 10 - Uniform Search  
Lecture 11 - Uniformed Search  
Lecture 12 - Uniformed Search  
Lecture 13 - Uniformed Search  
Lecture 14 - Uniformed Search  
Lecture 15 - Informed Search  
Lecture 16 - Informed Search  
Lecture 17 - Informed Search  
Lecture 18 - Informed Search Proof of optimality of A\* - Part 4  
Lecture 19 - Informed Search  
Lecture 20 - Informed Search  
Lecture 21 - Informed Search  
Lecture 22 - Local Search  
Lecture 23 - Local Search  
Lecture 24 - Local Search  
Lecture 25 - Local Search  
Lecture 26 - Local Search  
Lecture 27 - Local Search  
Lecture 28 - Local Search  
Lecture 29 - Adversarial Search

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Adversarial Search
- Lecture 31 - Adversarial Search
- Lecture 32 - Adversarial Search
- Lecture 33 - Adversarial Search
- Lecture 34 - Adversarial Search
- Lecture 35 - Adversarial Search
- Lecture 36 - Constraint Satisfaction Problems
- Lecture 37 - Constraint Satisfaction Problems
- Lecture 38 - Constraint Satisfaction Problems
- Lecture 39 - Constraint Satisfaction Problems
- Lecture 40 - Constraint Satisfaction Problems
- Lecture 41 - Constraint Satisfaction Problems
- Lecture 42 - Logic in AI
- Lecture 43 - Logic in AI
- Lecture 44 - Logic in AI
- Lecture 45 - Logic in AI
- Lecture 46 - Logic in AI
- Lecture 47 - Logic in AI
- Lecture 48 - Logic in AI
- Lecture 49 - Logic in AI
- Lecture 50 - Uncertainty in AI
- Lecture 51 - Uncertainty in AI
- Lecture 52 - Uncertainty in AI
- Lecture 53 - Bayesian Networks
- Lecture 54 - Bayesian Networks
- Lecture 55 - Bayesian Networks
- Lecture 56 - Bayesian Networks
- Lecture 57 - Bayesian Networks
- Lecture 58 - Bayesian Networks
- Lecture 59 - Bayesian Networks
- Lecture 60 - Bayesian Networks
- Lecture 61 - Bayesian Networks
- Lecture 62 - Bayesian Networks
- Lecture 63 - Bayesian Networks
- Lecture 64 - Bayesian Networks
- Lecture 65 - Introduction, Part 10
- Lecture 66 - Decision Theory
- Lecture 67 - Decision Theory
- Lecture 68 - Probabilistic Uncertainty and Value of perfect information

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Expected Utility vs Expected Value
- Lecture 70 - Markov Decision Processes
- Lecture 71 - Markov Decision Processes
- Lecture 72 - Markov Decision Processes
- Lecture 73 - Markov Decision Processes
- Lecture 74 - Markov Decision Processes
- Lecture 75 - Markov Decision Processes
- Lecture 76 - Reinforcement Learning
- Lecture 77 - Reinforcement Learning
- Lecture 78 - Reinforcement Learning
- Lecture 79 - Reinforcement Learning
- Lecture 80 - Reinforcement Learning
- Lecture 81 - Reinforcement Learning
- Lecture 82 - Reinforcement Learning
- Lecture 83 - Reinforcement Learning
- Lecture 84 - Deep Learning
- Lecture 85 - Deep Learning
- Lecture 86 - Deep Learning
- Lecture 87 - Deep Learning
- Lecture 88 - Deep Learning
- Lecture 89 - Deep Learning
- Lecture 90 - Deep Learning
- Lecture 91 - Deep Learning
- Lecture 92 - Ethics of AI
- Lecture 93 - Ethics of AI
- Lecture 94 - Ethics of AI
- Lecture 95 - Ethics of AI
- Lecture 96 - Wrapup

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Advanced Computer Architecture (2021)

Subject Co-ordinator - Prof. Smruti R. Sarangi

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Out-of-Order Pipelines - Part I  
Lecture 3 - Out-of-Order Pipelines - Part II  
Lecture 4 - Out-of-Order Pipelines - Part III  
Lecture 5 - The Fetch and Decode Stages - Part I  
Lecture 6 - The Fetch and Decode Stages - Part II  
Lecture 7 - The Fetch and Decode Stages - Part III  
Lecture 8 - The Issue, Execute, and Commit Stages - Part I  
Lecture 9 - The Issue, Execute, and Commit Stages - Part II  
Lecture 10 - The Issue, Execute, and Commit Stages - Part III  
Lecture 11 - The Issue, Execute, and Commit Stages - Part IV  
Lecture 12 - Alternative Approaches to Issue and Commit - Part I  
Lecture 13 - Alternative Approaches to Issue and Commit - Part II  
Lecture 14 - Alternative Approaches to Issue and Commit - Part III  
Lecture 15 - Alternative Approaches to Issue and Commit - Part IV  
Lecture 16 - Graphics Processors - Part I  
Lecture 17 - Graphics Processors - Part II  
Lecture 18 - Graphics Processors - Part III  
Lecture 19 - Caches - Part I  
Lecture 20 - Caches - Part II  
Lecture 21 - Caches - Part III  
Lecture 22 - Caches - Part IV  
Lecture 23 - Caches - Part V  
Lecture 24 - Caches - Part VI  
Lecture 25 - Multicore Systems - Part I  
Lecture 26 - Multicore Systems - Part II  
Lecture 27 - Multicore Systems - Part III  
Lecture 28 - Multicore Systems - Part IV  
Lecture 29 - Multicore Systems - Part V

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Multicore Systems - Part VI
- Lecture 31 - Multicore Systems - Part VII
- Lecture 32 - Multicore Systems - Part VIII
- Lecture 33 - Multicore Systems - Part IX

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Advanced Distributed systems

Subject Co-ordinator - Prof. Smruti R. Sarangi

Co-ordinating Institute - IIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1  
Lecture 2  
Lecture 3  
Lecture 4  
Lecture 5  
Lecture 6  
Lecture 7  
Lecture 8  
Lecture 9  
Lecture 10  
Lecture 11  
Lecture 12  
Lecture 13  
Lecture 14  
Lecture 15  
Lecture 16  
Lecture 17  
Lecture 18  
Lecture 19  
Lecture 20  
Lecture 21  
Lecture 22  
Lecture 23  
Lecture 24  
Lecture 25  
Lecture 26  
Lecture 27  
Lecture 28

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Design Verification and Test of Digital VLSI Circuits

Subject Co-ordinator - Dr. Santosh Biswas, Prof. Jatindra Kumar Deka

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Digital VLSI Design Flow

Lecture 2 - High Level Design Representation

Lecture 3 - Transformations for High Level Synthesis

Lecture 4 - Introduction to HLS

Lecture 5 - Scheduling Algorithms - 1

Lecture 6 - Scheduling Algorithms - 2

Lecture 7 - Binding and Allocation Algorithms

Lecture 8 - Two level Boolean Logic Synthesis - 1

Lecture 9 - Two level Boolean Logic Synthesis - 2

Lecture 10 - Two level Boolean Logic Synthesis - 3

Lecture 11 - Heuristic Minimization of Two-Level Circuits

Lecture 12 - Finite State Machine Synthesis

Lecture 13 - Multilevel Implementation

Lecture 14 - Introduction to formal methods for design verification

Lecture 15 - Temporal Logic

Lecture 16 - Syntax and Semantics of CTL

Lecture 17 - Syntax and Semantics of CTL â Continued

Lecture 18 - Equivalence between CTL Formulas

Lecture 19 - Introduction to Model Checking

Lecture 20 - Model Checking Algorithms - I

Lecture 21 - Model Checking Algorithms - II

Lecture 22 - Model Checking with Fairness

Lecture 23 - Binary Decision Diagram

Lecture 24 - Ordered Binary Decision Diagram

Lecture 25 - Operation on Ordered Binary Decision Diagram

Lecture 26 - Ordered Binary Decision Diagram for State Transition Systems

Lecture 27 - Symbolic Model Checking

Lecture 28 - Introduction to Digital VLSI Testing

Lecture 29 - Functional and Structural Testing

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Fault Equivalence
- Lecture 31 - Fault Simulation - 1
- Lecture 32 - Fault Simulation - 2
- Lecture 33 - Fault Simulation - 3
- Lecture 34 - Testability Measures (SCOAP)
- Lecture 35 - Introduction to Automatic Test Pattern Generation (ATPG) and ATPG Algebras
- Lecture 36 - D-Algorithm - 1
- Lecture 37 - D-Algorithm - 2
- Lecture 38 - ATPG for Synchronous Sequential Circuits
- Lecture 39 - Scan Chain based Sequential Circuit Testing - 1
- Lecture 40 - Scan Chain based Sequential Circuit Testing - 2
- Lecture 41 - Built in Self Test - 1
- Lecture 42 - Built in Self Test - 2
- Lecture 43 - Memory Testing - 1
- Lecture 44 - Memory Testing - 2

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computer Organization and Architecture - A Pedagogy

Subject Co-ordinator - Prof.Arnab sarkar, Prof.Jatindra Kumar Deka, Dr. Santosh Biswas

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Model of Computer and Working Principle

Lecture 2 - Digital Logic Building Blocks

Lecture 3 - Information Representation and Number Systems

Lecture 4 - Basic Elements of a Processor

Lecture 5 - Storage and I/O Interface

Lecture 6 - Execution of Program and Programming Languages

Lecture 7 - Components of Central Processing Unit (CPU) and External Interface

Lecture 8 - Main Memory

Lecture 9 - Instruction Execution

Lecture 10 - Instruction Format

Lecture 11 - Instruction Set

Lecture 12 - Addressing Modes

Lecture 13 - Flags and Conditional Instructions

Lecture 14 - Instruction

Lecture 15 - Instruction Cycle and Micro-operations

Lecture 16 - Control Signals and Timing Sequence

Lecture 17 - Control Signals for Complete Instruction Execution

Lecture 18 - Handling Different Addressing Modes

Lecture 19 - Handling Control Transfer Instructions

Lecture 20 - Design of Hardwired controlled Control Unit

Lecture 21 - Microinstructions and Microprograms

Lecture 22 - Organization and Optimization of Microprogrammed controlled Control Unit

Lecture 23 - Different Internal CPU Bus Organization

Lecture 24 - Basics of Memory and Cache - Part 1

Lecture 25 - Basics of Memory and Cache - Part 2

Lecture 26 - Direct-mapped Caches

Lecture 27 - Associative and Multi-level Caches

Lecture 28 - Summary - Caches

Lecture 29 - Basics of Virtual Memory and Address Translation

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- Lecture 30 - Paging and Segmentation
- Lecture 31 - TLBs and Page Fault Handling
- Lecture 32 - Cache Indexing and Tagging Variations, Demand Paging
- Lecture 33 - Page Replacement Algorithms
- Lecture 34 - Page Frame Allocation and Thrashing
- Lecture 35 - Summary - Virtual Memory
- Lecture 36 - Input-Output Primitives
- Lecture 37 - Interrupt Driven I/O
- Lecture 38 - DMA Transfer
- Lecture 39 - Storage Devices

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Embedded Systems-Design Verification and Test

Subject Co-ordinator - Prof.Jatindra Kumar Deka, Dr. Santosh Biswas, Prof.Arnab Sarkar

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction

Lecture 2 - Modeling Techniques - 1

Lecture 3 - Modeling Techniques - 2

Lecture 4 - Hardware/Software Partitioning - 1

Lecture 5 - Hardware/Software Partitioning - 2

Lecture 6 - Introduction to Hardware Design

Lecture 7 - Hardware Architectural Synthesis - 1

Lecture 8 - Hardware Architectural Synthesis - 2

Lecture 9 - Hardware Architectural Synthesis - 3

Lecture 10 - Hardware Architectural Synthesis - 4

Lecture 11 - Hardware Architectural Synthesis - 5

Lecture 12 - Hardware Architectural Synthesis - 6

Lecture 13 - Hardware Architectural Synthesis - 7

Lecture 14 - System Level Analysis

Lecture 15 - Uniprocessor Scheduling - 1

Lecture 16 - Uniprocessor Scheduling - 2

Lecture 17 - Multiprocessor Scheduling - 1

Lecture 18 - Multiprocessor Scheduling - 2

Lecture 19 - Introduction and Basic Operators of Temporal Logic

Lecture 20 - Syntax and Semantics of CTL

Lecture 21 - Equivalence between CTL formulas

Lecture 22 - Model Checking Algorithm

Lecture 23 - Binary Decision Diagram

Lecture 24 - Use of OBDDs for State Transition System

Lecture 25 - Symbolic Model Checking

Lecture 26 - Introduction to Digital VLSI Testing

Lecture 27 - Automatic Test Pattern Generation (ATPG)

Lecture 28 - Scan Chain based Sequential Circuit Testing

Lecture 29 - Software-Hardware Co-validation Fault Models and High Level Testing for Complex Embedded Systems

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- Lecture 30 - Testing for embedded cores
- Lecture 31 - Bus and Memory Testing
- Lecture 32 - Testing for advanced faults in Real time Embedded Systems
- Lecture 33 - BIST for Embedded Systems
- Lecture 34 - Concurrent Testing for Fault tolerant Embedded Systems - 1
- Lecture 35 - Concurrent Testing for Fault tolerant Embedded Systems - 2
- Lecture 36 - Testing for Re-programmable hardware
- Lecture 37 - Interaction Testing between Hardware and Software

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Multi-Core Computer Architecture-Storage and Interconnectivity

Subject Co-ordinator - Prof. John Jose

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction and Overview of the Course
- Lecture 2 - Instruction Execution Principles
- Lecture 3 - Introduction to Instruction Pipeline
- Lecture 4 - Introduction to Superscalar Pipelines
- Lecture 5 - Instruction Pipeline and Performance - I
- Lecture 6 - Instruction Pipeline and Performance - II
- Lecture 7 - Introduction to Cache Memory
- Lecture 8 - Block Replacement Techniques and Write Strategy
- Lecture 9 - gem5 Simulator - An Overview
- Lecture 10 - Cache Memory
- Lecture 11 - Basic Cache Optimization Techniques
- Lecture 12 - gem5 Simulator - Cache Optimisation
- Lecture 13 - Advanced Cache Optimization Techniques - I
- Lecture 14 - Advanced Cache Optimization Techniques - II
- Lecture 15 - Cache Memory Optimizations
- Lecture 16 - Introduction to DRAM System
- Lecture 17 - DRAM Controllers and Address Mapping
- Lecture 18 - Address Translation Mechanisms
- Lecture 19 - Main Memory Concepts
- Lecture 20 - Introduction to Tiled Chip Multicore Processors
- Lecture 21 - Routing Techniques in Network On Chip
- Lecture 22 - Network On Chip Router Micro-Architecture
- Lecture 23 - gem5 Simulator - NoC Optimisation
- Lecture 24 - Energy Efficient Bufferless NoC Routers
- Lecture 25 - Sidebuffered Deflection Routers
- Lecture 26 - Concepts in Network on Chip
- Lecture 27 - QoS of NoC and Caches in TCMP Systems
- Lecture 28 - Emerging Trends in Network On Chips
- Lecture 29 - Concepts in TCMP Systems

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Multi-Core Computer Architecture

Subject Co-ordinator - Prof. John Jose

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Review of Basic Computer Organization
- Lecture 2 - Instruction Set and Addressing Modes
- Lecture 3 - Instruction Encoding
- Lecture 4 - Performance Evaluation Methods
- Lecture 5 - Tutorial on Performance Evaluation
- Lecture 6 - Introduction to RISC Instruction Pipeline
- Lecture 7 - Instruction Pipeline Hazards
- Lecture 8 - Tutorial on Instruction Pipeline and Hazards
- Lecture 9 - Control Hazards and Branch Prediction
- Lecture 10 - MIPS Pipeline for Multi-Cycle Operations
- Lecture 11 - Tutorial on Longer Pipeline and Branch Prediction
- Lecture 12 - Compiler Techniques to Explore ILP
- Lecture 13 - Dynamic Scheduling to Explore ILP
- Lecture 14 - Dynamic Scheduling with Tomasulo's Algorithm
- Lecture 15 - Dynamic Scheduling with Speculative Execution
- Lecture 16 - Tutorial on Static and Dynamic Scheduling
- Lecture 17 - Advanced Pipelining and Superscalar Processors
- Lecture 18 - Introduction to GPU architectures
- Lecture 19 - Case study on GPU architectures
- Lecture 20 - Tutorial on Superscalar processors and GPU
- Lecture 21 - Introduction to Cache Memory
- Lecture 22 - Block Replacement Techniques and Write Strategy
- Lecture 23 - Design Concepts in Cache Memory
- Lecture 24 - Optimization Techniques in Cache Memory
- Lecture 25 - Advanced Cache Optimization Techniques
- Lecture 26 - Tutorial on Advanced Concepts in Cache Memory - 1
- Lecture 27 - Tutorial on Advanced Concepts in Cache Memory - 2
- Lecture 28 - Cache coherence and memory consistency
- Lecture 29 - Design Space for snooping protocols

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Directory Based Cache coherence
- Lecture 31 - Cache coherence in multiprocessor design [T]
- Lecture 32 - Introduction to DRAM System
- Lecture 33 - DRAM Controllers and Address Mapping
- Lecture 34 - Secondary Storage Systems
- Lecture 35 - Design Concepts in Storage Systems
- Lecture 36 - Introduction to Tiled Chip Multicore Processors
- Lecture 37 - Routing Techniques in Network On Chip
- Lecture 38 - Network On Chip Router Micro-Architecture
- Lecture 39 - Concepts in Network on Chip
- Lecture 40 - Energy Efficient Bufferless NoC Routers
- Lecture 41 - Sidebuffered Deflection Routers
- Lecture 42 - Concepts in Deflection Routers [T]
- Lecture 43 - QoS of NoC and Caches in TCMP Systems
- Lecture 44 - Emerging Trends in Network On Chips
- Lecture 45 - Domain Specific Accelerators
- Lecture 46 - Introduction to VEGA Microprocessors (Case Study)
- Lecture 47 - Concepts in TCMP Systems
- Lecture 48 - How to Explore Computer Architecture?

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Randomized Algorithms

Subject Co-ordinator - Prof. Benny George K

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Randomized Algorithms
- Lecture 2 - Randomized Mincut Algorithm
- Lecture 3 - Randomized Find
- Lecture 4 - Probability Review
- Lecture 5 - Expectation of Random Variables
- Lecture 6 - Conditional Probability and Conditional Expectation2
- Lecture 7 - Birthday Paradox
- Lecture 8 - Markov and Chebychev's Inequalities
- Lecture 9 - Median Algorithm
- Lecture 10 - Chernoff Bound
- Lecture 11 - Permutation Routing on a Hypercube
- Lecture 12 - Permutation Routing on a Hypercube (Analysis)
- Lecture 13 - Introduction to Probabilistic Method
- Lecture 14 - More Examples on Probabilistic Method
- Lecture 15 - Lovasz Local Lemma
- Lecture 16 - Introduction to Markov Chains
- Lecture 17 - 2-SAT and Markov Chains
- Lecture 18 - 3-SAT and Markov Chains
- Lecture 19 - Electrical Networks
- Lecture 20 - Cover Time
- Lecture 21 - Rapid Mixing
- Lecture 22 - Introduction to Computational Complexity
- Lecture 23 - Pratt's Certificate
- Lecture 24 - Primality Testing
- Lecture 25 - Miller Rabin Algorithm
- Lecture 26 - All pair shortest path - I
- Lecture 27 - All pair shortest path - II
- Lecture 28 - Randomized MST
- Lecture 29 - Introduction to approximate counting

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - DNF counting
- Lecture 31 - Perfect Matching - I
- Lecture 32 - Perfect Matching - II
- Lecture 33 - Perfect Matching - III
- Lecture 34 - Treaps
- Lecture 35 - Hashing
- Lecture 36 - Probabilistically checkable proofs - I
- Lecture 37 - Probabilistically checkable proofs - II
- Lecture 38 - Probabilistically checkable proofs - III
- Lecture 39 - LFKN Protocol
- Lecture 40 - summary

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Parallel Algorithms

Subject Co-ordinator - Prof. Sajith Gopalan

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Shared Memory Models - 1  
Lecture 2 - Shared Memory Models - 2  
Lecture 3 - Interconnection Networks  
Lecture 4 - Cost and Optimality  
Lecture 5 - Basic Techniques - 1  
Lecture 6 - Basic Techniques - 2  
Lecture 7 - Basic Techniques - 3  
Lecture 8 - Basic Techniques - 4  
Lecture 9 - Basic Techniques - 5  
Lecture 10 - Odd Even Merge Sort (OEMS)  
Lecture 11 - OEMS, Bitonic-Sort-Merge Sort (BSMS)  
Lecture 12 - BSMS, Optimal List Colouring  
Lecture 13 - Description  
Lecture 14 - Analysis  
Lecture 15 - Applications  
Lecture 16 - Applications  
Lecture 17 - Fast optimal merge algorithm  
Lecture 18 - High level Description  
Lecture 19 - Cole's Merge Sort  
Lecture 20 - Analysis of Cole's Merge Sort; Lower bound for sorting  
Lecture 21 - Sorting Lower bound; Connected Components  
Lecture 22 - Connected Components (CREW)  
Lecture 23 - Connected Components, Vertex Colouring  
Lecture 24 - Sorting on a 2D mesh  
Lecture 25 - Sorting on a 2D mesh  
Lecture 26 - Sorting, Offline routing on a 2D mesh  
Lecture 27 - Sorting on a 3D mesh  
Lecture 28 - Mesh of Trees, Hypercube  
Lecture 29 - Hypercube (Continued...)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Hypercube (Continued...), butterfly network
- Lecture 31 - Butterfly, CCC and Benes Networks
- Lecture 32 - Butterfly, CCC and Benes Networks
- Lecture 33 - Shuffle Exchange Graphs, de Bruijn Graphs
- Lecture 34 - Interconnection Networks Algorithms
- Lecture 35 - Circuit Value Problem is P-complete for NC-reductions
- Lecture 36 - Ordered DFS is P-complete for NC-reductions
- Lecture 37 - Max Flow is P-complete for NC-reductions

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Discrete Mathematics (Prof. Sajith Gopalan)

Subject Co-ordinator - Prof. Benny George K

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Boolean Functions
- Lecture 2 - Propositional Calculus
- Lecture 3 - First Order Logic
- Lecture 4 - First Order Logic
- Lecture 5 - Proof System for Propcal
- Lecture 6 - First Order Logic
- Lecture 7 - Soundness and Completeness of the First Order Proof System
- Lecture 8 - Sets, Relations, Functions
- Lecture 9 - Functions, Embedding of the theories of naturals numbers and integers in Set Theory
- Lecture 10 - Embedding of the theories of integers and rational numbers in Set Theory; Countable Sets
- Lecture 11 - Introduction to graph theory
- Lecture 12 - Trees, Cycles, Graph coloring
- Lecture 13 - Bipartite Graphs
- Lecture 14 - Bipartite Graphs; Edge Coloring and Matching
- Lecture 15 - Planar Graphs
- Lecture 16 - Graph Searching; BFS and DFS
- Lecture 17 - Network Flows
- Lecture 18 - Counting Spanning Trees in Complete Graphs
- Lecture 19 - Embedding of the theory of real numbers in Set Theory; Paradoxes
- Lecture 20 - ZF Axiomatization of Set Theory
- Lecture 21 - Partially ordering relations
- Lecture 22 - Natural numbers, divisors
- Lecture 23 - Lattices
- Lecture 24 - GCD, Euclid's Algorithm
- Lecture 25 - Prime Numbers
- Lecture 26 - Congruences
- Lecture 27 - Pigeon Hole Principle
- Lecture 28 - Stirling Numbers, Bell Numbers
- Lecture 29 - Generating Functions

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Product of Generating Functions
- Lecture 31 - Composition of Generating Function
- Lecture 32 - Principle of Inclusion Exclusion
- Lecture 33 - Rook placement problem
- Lecture 34 - Solution of Congruences
- Lecture 35 - Chinese Remainder Theorem
- Lecture 36 - Totient; Congruences; Floor and Ceiling Functions
- Lecture 37 - Introduction to Groups
- Lecture 38 - Modular Arithmetic and Groups
- Lecture 39 - Dihedral Groups, Isomorphisms
- Lecture 40 - Cyclic groups, Direct Products, Subgroups
- Lecture 41 - Cosets, Lagrange's theorem
- Lecture 42 - Rings and Fields
- Lecture 43 - Construction of Finite Fields

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Advanced Computer Architecture

Subject Co-ordinator - Prof. John Jose

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Review of Basic Computer Organization
- Lecture 2 - Performance Evaluation Methods
- Lecture 3 - Introduction to RISC Instruction Pipeline
- Lecture 4 - Instruction Pipeline and Performance
- Lecture 5 - Pipeline Hazards
- Lecture 6 - Control Hazards and Branch Prediction
- Lecture 7 - MIPS Pipeline for Multi-Cycle Operations
- Lecture 8 - Tutorial 2
- Lecture 9 - Compiler Techniques to Explore ILP
- Lecture 10 - Dynamic Scheduling to Explore ILP
- Lecture 11 - Dynamic Scheduling with Tomasulo's Algorithm
- Lecture 12 - Dynamic Scheduling with Speculative Execution
- Lecture 13 - Tutorial 3
- Lecture 14 - Advanced Pipelining and Superscalar Processors
- Lecture 15 - Exploiting DLP
- Lecture 16 - Tutorial 4
- Lecture 17 - Tutorial 5
- Lecture 18 - Introduction to Cache Memory
- Lecture 19 - Block Replacement Techniques and Write Strategy
- Lecture 20 - Tutorial 6
- Lecture 21 - Optimization Techniques in Cache Memory
- Lecture 22 - Advanced Cache Optimization Techniques
- Lecture 23 - Tutorial 7
- Lecture 24 - Tutorial 8
- Lecture 25 - Introduction to DRAM System
- Lecture 26 - DRAM Controllers and Address Mapping
- Lecture 27 - Secondary Storage Systems
- Lecture 28 - Tutorial 9
- Lecture 29 - Tiled Chip Multicore Processors

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Routing Techniques in Network on Chip
- Lecture 31 - NoC Router Microarchitecture
- Lecture 32 - How to Explore Computer Architecture?
- Lecture 33 - Tutorial 10

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:User-centric Computing for Human-Computer Interaction

Subject Co-ordinator - Prof. Samit Bhattacharya

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to UCC and history
- Lecture 2 - Issues and challenges
- Lecture 3 - Latest research trends
- Lecture 4 - User-Centric Design and Software Engineering
- Lecture 5 - Components of SDLC - Contextual Inquiry
- Lecture 6 - Components of SDLC - Design Guidelines
- Lecture 7 - Components of SDLC - Prototyping
- Lecture 8 - Case study (web site design)
- Lecture 9 - Introduction to User-Centric Computing
- Lecture 10 - The UCC framework with illustrative case study
- Lecture 11 - User-centric models - introduction and descriptive models
- Lecture 12 - User-centric models - predictive models and taxonomy
- Lecture 13 - Introduction to GOMS family of models
- Lecture 14 - Keystroke-Level Model (KLM)
- Lecture 15 - (CMN)GOMS Model
- Lecture 16 - The Fitts' Law
- Lecture 17 - The Hick-Hyman Law
- Lecture 18 - 2D and 3D pointing models
- Lecture 19 - The Steering Law for constrained navigation
- Lecture 20 - Model for hierarchical menu selection
- Lecture 21 - Mobile typing models (single finger and two thumb typing)
- Lecture 22 - Model for touch performance (FFitts' law)
- Lecture 23 - Introduction to formal models in UCD
- Lecture 24 - Formal modeling of user-computer dialogue
- Lecture 25 - Case studies on the use of models
- Lecture 26 - Introduction and research question formulation
- Lecture 27 - Variables determination and experiment design
- Lecture 28 - Data analysis including model building
- Lecture 29 - Introduction to user-centric design evaluation and expert evaluation technique

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - User evaluation, empirical and model-based evaluation
- Lecture 31 - Concluding remarks

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computer Graphics

Subject Co-ordinator - Prof. Samit Bhattacharya

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to graphics
- Lecture 2 - Historical evolution, issues and challenges
- Lecture 3 - Basics of a graphics system
- Lecture 4 - Introduction to 3D graphics pipeline
- Lecture 5 - Introduction and overview on object representation techniques
- Lecture 6 - Various Boundary Representation Techniques
- Lecture 7 - Spline representation - I
- Lecture 8 - Spline representation - II
- Lecture 9 - Space representation methods
- Lecture 10 - Introduction to modeling transformations
- Lecture 11 - Matrix representation and composition of transformations
- Lecture 12 - Transformations in 3D
- Lecture 13 - Color computation - basic idea
- Lecture 14 - Simple lighting model
- Lecture 15 - Shading models
- Lecture 16 - Intensity mapping
- Lecture 17 - Color models and texture synthesis
- Lecture 18 - View transformation
- Lecture 19 - Projection transformation
- Lecture 20 - Windows-to-viewport transformation
- Lecture 21 - Clipping introduction and 2D point and line clipping
- Lecture 22 - 2D fill-area clipping and 3D clipping
- Lecture 23 - Hidden surface removal - I
- Lecture 24 - Hidden surface removal - II
- Lecture 25 - Scan conversion of basic shapes - I
- Lecture 26 - Scan conversion of basic shapes - II
- Lecture 27 - Fill area and character scan conversion
- Lecture 28 - Anti-aliasing techniques
- Lecture 29 - Graphics I/O Devices

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Introduction to GPU and Shaders
- Lecture 31 - Programming with OpenGL
- Lecture 32 - Concluding remarks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:C-Based VLSI Design

Subject Co-ordinator - Prof. Chandan Karfa

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to C-Based VLSI Design
- Lecture 2 - C-based VLSI Design: An Overview
- Lecture 3 - C-based VLSI Design: Problem Formulation
- Lecture 4 - C-based VLSI Design: Course Plan
- Lecture 5 - Introduction to Scheduling
- Lecture 6 - ILP formulation of Scheduling
- Lecture 7 - ILP formulation of MRLC and MLRC Scheduling
- Lecture 8 - Multiprocessor Scheduling
- Lecture 9 - Hu's algorithm for Multiprocessor Scheduling
- Lecture 10 - List based Scheduling of MLRC
- Lecture 11 - List based Scheduling of MRLC
- Lecture 12 - Forced Directed Scheduling
- Lecture 13 - Forced Directed MLRC and MRLC Scheduling Algorithm
- Lecture 14 - Path Based Scheduling
- Lecture 15 - Path Based Scheduling
- Lecture 16 - Allocation and Binding Problem Formulation
- Lecture 17 - Left Edge Algorithm
- Lecture 18 - ILP Formulation of Allocation and Binding
- Lecture 19 - Allocation and Binding for Hierarchical Graph
- Lecture 20 - Register Allocation and Binding
- Lecture 21 - Multi-port Binding Problem
- Lecture 22 - Datapath and Controller Synthesis
- Lecture 23 - HLS for Arrays
- Lecture 24 - HLS for Loops
- Lecture 25 - HLS for Loop - pipeline
- Lecture 26 - Hardware Efficient C Coding - Part I
- Lecture 27 - Hardware Efficient C Coding - Part II
- Lecture 28 - Dataflow Optimization in HLS
- Lecture 29 - Frontend Optimizations in C

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - HLS Optimizations: Case Study 1
- Lecture 31 - HLS Optimizations: Case Study 1
- Lecture 32 - Simulation based Verification
- Lecture 33 - RTL to C Reverse Engineering
- Lecture 34 - Phase-wise Verification of HLS
- Lecture 35 - Equivalence between C and RTL
- Lecture 36 - HLS for Security
- Lecture 37 - Introduction to Hardware Security
- Lecture 38 - Attacks on RTL Logic locking
- Lecture 39 - Introduction to Logic Synthesis
- Lecture 40 - FPGA Technology Mapping
- Lecture 41 - Introduction to Physical Synthesis
- Lecture 42 - Introduction to Circuit optimizations
- Lecture 43 - Recent Advances in C-Based VLSI Design

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Design and Implementation of Human-Computer Inter

Subject Co-ordinator - Prof. Samit Bhattacharya

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Interactive Systems
- Lecture 2 - Introduction to Usability
- Lecture 3 - Engineering for Usability
- Lecture 4 - Interactive System Life Cycle
- Lecture 5 - Usability Requirements
- Lecture 6 - Contextual Inquiry
- Lecture 7 - Functional Requirements Specification
- Lecture 8 - Case Study on SRS
- Lecture 9 - Case Study (Usability Requirement Gathering)
- Lecture 10 - Case Study (Other Requirement Gathering)
- Lecture 11 - Case Study - Non-Functional Requirements to SRS
- Lecture 12 - Introduction to Interface Design
- Lecture 13 - Shneiderman's Golden Rules
- Lecture 14 - Norman's Principles
- Lecture 15 - Prototyping
- Lecture 16 - Prototype Evaluation - I
- Lecture 17 - Prototype Evaluation - II
- Lecture 18 - Case Study on Prototype Evaluation - I
- Lecture 19 - Case Study on Prototype Evaluation - II
- Lecture 20 - Basics of System Design
- Lecture 21 - Data Flow Diagram
- Lecture 22 - Entity Relationship Diagram
- Lecture 23 - Case Study on DFD and ER
- Lecture 24 - Introduction to Object Oriented Design
- Lecture 25 - UML
- Lecture 26 - UML Case Study
- Lecture 27 - Coding Basics
- Lecture 28 - Code Testing Basics
- Lecture 29 - Review-Based Code Testing

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Code Review Case Study
- Lecture 31 - Black-Box Testing - I
- Lecture 32 - Black-Box Testing - II
- Lecture 33 - Black-Box Testing Case Study
- Lecture 34 - White-Box Testing
- Lecture 35 - White-Box Testing Case Study
- Lecture 36 - System Integration and Testing
- Lecture 37 - Empirical Usability Evaluation - I
- Lecture 38 - Empirical Usability Evaluation - II
- Lecture 39 - Experiment Design - I
- Lecture 40 - Experiment Design - II
- Lecture 41 - Empirical Data Analysis
- Lecture 42 - Project Management
- Lecture 43 - Note on Agile Development
- Lecture 44 - Concluding Remarks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Digital Design with Verilog

Subject Co-ordinator - Prof. Chandan Karfa, Prof. Aryabartta Sahu

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Digital Design with Verilog
- Lecture 2 - Switching Algebra
- Lecture 3 - Canonical Forms of Switching Functions
- Lecture 4 - Number Systems
- Lecture 5 - Binary Arithmetic
- Lecture 6 - Binary Codes
- Lecture 7 - Error Detection and Corrections Codes
- Lecture 8 - Minimization of Switching functions-Karnaugh Map
- Lecture 9 - Karnaugh Map
- Lecture 10 - Minimization of Switching functions-Properties
- Lecture 11 - Quine-McCluskey Method
- Lecture 12 - Quine-McCluskey Method-Prime Implication Chart
- Lecture 13 - ESPRESSO-Heuristic Based Switching Function Minimization
- Lecture 14 - Multi-level Logic Minimization
- Lecture 15 - Multi-level Logic Minimization-Kernels Extraction
- Lecture 16 - Digital Circuits Modelling using Verilog
- Lecture 17 - Modelling Techniques in Verilog
- Lecture 18 - Behavioral Modelling in Verilog
- Lecture 19 - Digital System Design using Verilog
- Lecture 20 - Testbench in Verilog
- Lecture 21 - Code Conversion, Parity Bit Generator
- Lecture 22 - Comparator, Multiplexer
- Lecture 23 - Encoder, Decoder
- Lecture 24 - Ripple Carry Adder, Carry Look ahead Adder
- Lecture 25 - Adder/Subtractor
- Lecture 26 - BCD Adder, Multiplier
- Lecture 27 - Latch/Storage Design
- Lecture 28 - Flipflop Design, Characteristics of Flipflop
- Lecture 29 - Flipflop, Register and Memory

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Digital Counter
- Lecture 31 - Finite State Machine Design and Implementation with many Examples
- Lecture 32 - FSM Completeness and Correctness
- Lecture 33 - Sync Counter using FSM, Implementation using different FFs and Comparison of types of FSM
- Lecture 34 - FSM State Optimization using Row Matching and Partitioning Methods
- Lecture 35 - State Optimization using Implication chart and State Encoding
- Lecture 36 - RTL Design, Introduction to ASM (Algorithmic State Machine)
- Lecture 37 - RTL/ASM Design Examples and Implementation
- Lecture 38 - ASM Data Path Inference and Control Path Generation
- Lecture 39 - Sequential Multiplier the Classic Example of RTL Design
- Lecture 40 - Introduction to FPGA and Design Flow
- Lecture 41 - Introduction to Electronic Design Automation

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Parallel Computer Architecture

Subject Co-ordinator - Prof. Hemangee K. Kapoor

Co-ordinating Institute - IIT - Guwahati

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Why do we need parallel architecture ?  
Lecture 2 - Multicore Revolution  
Lecture 3 - What is Parallel Architecture?  
Lecture 4 - Performance and Benchmarking  
Lecture 5 - Reporting Results  
Lecture 6 - Some Laws  
Lecture 7 - A shift from sequential to parallel  
Lecture 8 - Programming Models  
Lecture 9 - Shared Memory Paradigm  
Lecture 10 - Message Passing Paradigm  
Lecture 11 - Examples  
Lecture 12 - Cache Basics  
Lecture 13 - Memory hierarchy questions - 1  
Lecture 14 - Memory hierarchy questions - 2  
Lecture 15 - Six basic cache optimisations - 1  
Lecture 16 - Six basic cache optimisations - 2  
Lecture 17 - Virtual Memory - 1  
Lecture 18 - Virtual Memory - 2  
Lecture 19 - Cache Coherence Problem  
Lecture 20 - Concept of Serialisation  
Lecture 21 - Coherence related Conditions  
Lecture 22 - Types of Coherence Protocols - 1  
Lecture 23 - Types of Coherence Protocols - 2  
Lecture 24 - VI Protocol  
Lecture 25 - 3 State: MSI Protocol  
Lecture 26 - MESI Protocol  
Lecture 27 - Dragon Protocol  
Lecture 28 - Coherence misses  
Lecture 29 - Coherence misses example

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Correctness Requirements
- Lecture 31 - Single-Level caches with an Atomic Bus - 1
- Lecture 32 - Single-Level caches with an Atomic Bus - 2
- Lecture 33 - Multi-Level caches with an Atomic Bus - 1
- Lecture 34 - Multi-Level caches with an Atomic Bus - 2
- Lecture 35 - Split transaction Bus
- Lecture 36 - Phases in Split Transaction Bus
- Lecture 37 - Request table and Organization
- Lecture 38 - Path of a Cache Miss
- Lecture 39 - Multi-Level cache + Split transaction Bus
- Lecture 40 - Introduction to Directory Cache Coherence
- Lecture 41 - Basic Operation of a Directory
- Lecture 42 - Directory Organisations
- Lecture 43 - Directory Overhead Optimisations
- Lecture 44 - Directory Protocol optimisations
- Lecture 45 - Proving Correctness - 1
- Lecture 46 - Proving Correctness - 2
- Lecture 47 - SGI Origin Architecture
- Lecture 48 - Working of protocol
- Lecture 49 - Correctness Issues
- Lecture 50 - Sequent NUMA-Q Architecture
- Lecture 51 - Working of protocol - 1
- Lecture 52 - Working of protocol - 2
- Lecture 53 - Correctness and Protocol Interaction
- Lecture 54 - Sequential Consistency
- Lecture 55 - Implications of Sequential Consistency
- Lecture 56 - Relaxed Consistency Models - 1
- Lecture 57 - Relaxed Consistency Models - 2
- Lecture 58 - Relaxing all Orders
- Lecture 59 - Uninterruptible Instructions
- Lecture 60 - Implementation of atomic instructions
- Lecture 61 - Other synchronisation options
- Lecture 62 - Interconnect Overview
- Lecture 63 - Topologies
- Lecture 64 - Routing
- Lecture 65 - Flow Control

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Computer Algorithms - 2

Subject Co-ordinator - Prof. Shashank K. Mehta

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Graph\_Basics  
Lecture 2 - Breadth\_First\_Search  
Lecture 3 - Dijkstra\_Algo  
Lecture 4 - All Pair Shortest Path  
Lecture 5 - Matriods  
Lecture 6 - Minimum Spanning Tree  
Lecture 7 - Edmond's Matching Algo I  
Lecture 8 - Edmond's Matching Algo II  
Lecture 9 - Flow Networks  
Lecture 10 - Ford Fulkerson Method  
Lecture 11 - Edmond Karp Algo  
Lecture 12 - Matrix Inversion  
Lecture 13 - Matrix Decomposition  
Lecture 14 - Knuth Morris Pratt Algo  
Lecture 15 - Rabin Karp Algo  
Lecture 16 - NFA Simulation  
Lecture 17 - Integer-Polynomial Ops-I  
Lecture 18 - Integer-Polynomial Ops-II  
Lecture 19 - Integer-Polynomial Ops-III  
Lecture 20 - Chinese Remainder-I  
Lecture 21 - Chinese Remainder-II  
Lecture 22 - Chinese Remainder-III  
Lecture 23 - Discrete Fourier Transform-I  
Lecture 24 - Discrete Fourier Transform-II  
Lecture 25 - Discrete Fourier Transform-III  
Lecture 26 - Schonhage Strassen Algo  
Lecture 27 - Linear Programming-I  
Lecture 28 - Linear Programming-II  
Lecture 29 - Geometry-I

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Geometry-II
- Lecture 31 - Geometry-III
- Lecture 32 - Approximation Algo-I
- Lecture 33 - Approximation Algo-II
- Lecture 34 - Approximation Algo-III
- Lecture 35 - General

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Theory of Computation

Subject Co-ordinator - Prof. Somenath Biswas

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - What is theory of computation? Set membership problem, basic notions like alphabet, strings, form
- Lecture 2 - Introduction to finite automaton
- Lecture 3 - Finite automata continued, deterministic finite automata (DFAs), language accepted by a DFA
- Lecture 4 - Regular languages, their closure properties
- Lecture 5 - DFAs solve set membership problems in linear time, pumping lemma
- Lecture 6 - More examples of nonregular languages, proof of pumping lemma, pumping lemma as a game, converse
- Lecture 7 - A generalization of pumping lemma, nondeterministic finite automata (NFAs), computation trees for
- Lecture 8 - Formal description of NFA, language accepted by NFA, such languages are also regular
- Lecture 9 - 'Guess and verify' paradigm for nondeterminism
- Lecture 10 - NFA's with epsilon transitions
- Lecture 11 - Regular expressions, they denote regular languages
- Lecture 12 - Construction of a regular expression for a language given a DFA accepting it. Algebraic closure
- Lecture 13 - Closure properties (Continued...)
- Lecture 14 - Closure under reversal, use of closure properties
- Lecture 15 - Decision problems for regular languages
- Lecture 16 - About minimization of states of DFAs. Myhill-Nerode theorem
- Lecture 17 - Continuation of proof of Myhill-Nerode theorem
- Lecture 18 - Application of Myhill-Nerode theorem. DFA minimization
- Lecture 19 - DFA minimization (Continued...)
- Lecture 20 - Introduction to context free languages (cfls) and context free grammars (cfgs). Derivation of st
- Lecture 21 - Languages generated by a cfg, leftmost derivation, more examples of cfgs and cfls
- Lecture 22 - Parse trees, inductive proof that  $L$  is  $L(G)$ . All regular languages are context free
- Lecture 23 - Towards Chomsky normal forms
- Lecture 24 - Simplification of cfgs continued, Removal of epsilon productions
- Lecture 25 - Elimination of unit productions. Converting a cfg into Chomsky normal form. Towards pumping lem
- Lecture 26 - Pumping lemma for cfls. Adversarial paradigm
- Lecture 27 - Completion of pumping lemma proof. Examples of use of pumping lemma. Converse of lemma does not
- Lecture 28 - Closure properties continued. cfls not closed under complementation
- Lecture 29 - Another example of a cfl whose complement is not a cfl. Decision problems for cfls

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - More decision problems. CYK algorithm for membership decision
- Lecture 31 - Introduction to pushdown automata (pda)
- Lecture 32 - pda configurations, acceptance notions for pdas. Transition diagrams for pdas
- Lecture 33 - Equivalence of acceptance by empty stack and acceptance by final state
- Lecture 34 - Turing machines (TM)
- Lecture 35 - Execution trace, another example (unary to binary conversion)
- Lecture 36 - Example continued. Finiteness of TM description, TM configuration, language acceptance, definition
- Lecture 37 - Notion of non-acceptance or rejection of a string by a TM. Multitrack TM, its equivalence to standard TM
- Lecture 38 - Simulation of multitape TMs by basic model. Nondeterministic TM (NDTM). Equivalence of NDTMs with basic TM
- Lecture 39 - Counter machines and their equivalence to basic TM model
- Lecture 40 - TMs can simulate computers, diagonalization proof
- Lecture 41 - Existence of non-r.e. languages, recursive languages, notion of decidability
- Lecture 42 - Separation of recursive and r.e. classes, halting problem and its undecidability

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Introduction to Problem Solving and Programming

Subject Co-ordinator - Prof. D. Gupta

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1  
Lecture 2  
Lecture 3  
Lecture 4  
Lecture 5  
Lecture 6  
Lecture 7  
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Lecture 22  
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Lecture 24

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Riemann Hypothesis and its Applications

Subject Co-ordinator - Prof. Manindra Agrawal

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture - 1  
Lecture - 2  
Lecture - 3  
Lecture - 4  
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Lecture - 29

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Lecture - 30

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Biometrics

Subject Co-ordinator - Prof. Phalguni Gupta

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Biometrics  
Lecture 2 - Biometrics  
Lecture 3 - Biometrics  
Lecture 4 - Biometrics  
Lecture 5 - Biometrics  
Lecture 6 - Biometrics  
Lecture 7 - Biometrics  
Lecture 8 - Biometrics  
Lecture 9 - Biometrics  
Lecture 10 - Biometrics  
Lecture 11 - Biometrics  
Lecture 12 - Biometrics  
Lecture 13 - Biometrics  
Lecture 14 - Biometrics  
Lecture 15 - Biometrics  
Lecture 16 - Biometrics  
Lecture 17 - Biometrics  
Lecture 18 - Biometrics  
Lecture 19 - Biometrics  
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Lecture 23 - Biometrics  
Lecture 24 - Biometrics  
Lecture 25 - Biometrics  
Lecture 26 - Biometrics

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Parallel Algorithm

Subject Co-ordinator - Prof. Phalguni Gupta

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Parallel Algorithm  
Lecture 2 - Parallel Algorithm  
Lecture 3 - Parallel Algorithm  
Lecture 4 - Parallel Algorithm  
Lecture 5 - Parallel Algorithm  
Lecture 6 - Parallel Algorithm  
Lecture 7 - Parallel Algorithm  
Lecture 8 - Parallel Algorithm  
Lecture 9 - Parallel Algorithm  
Lecture 10 - Parallel Algorithm  
Lecture 11 - Parallel Algorithm  
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Lecture 14 - Parallel Algorithm  
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Lecture 18 - Parallel Algorithm  
Lecture 19 - Parallel Algorithm  
Lecture 20 - Parallel Algorithm  
Lecture 21 - Parallel Algorithm  
Lecture 22 - Parallel Algorithm  
Lecture 23 - Parallel Algorithm  
Lecture 24 - Parallel Algorithm  
Lecture 25 - Parallel Algorithm

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Computer Architecture (Dr. Mainak Chaudhuri)

Subject Co-ordinator - Dr. Mainak Chaudhuri

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction, Amdahl's law, CPI equation
- Lecture 2 - CPI equation, research practices, instruction set architecture
- Lecture 3 - Instruction set architecture
- Lecture 4 - Instruction set architecture
- Lecture 5 - Instruction set architecture, case study with MIPS-I
- Lecture 6 - Case study with MIPS-I
- Lecture 7 - Case study with MIPS-I
- Lecture 8 - Binary instrumentation for architectural studies
- Lecture 9 - Binary instrumentation for architectural studies
- Lecture 10 - Basic pipelining, branch prediction
- Lecture 11 - Basic pipelining, branch prediction
- Lecture 12 - Basic pipelining, branch prediction
- Lecture 13 - Basic pipelining, branch prediction
- Lecture 14 - Basic pipelining, branch prediction
- Lecture 15 - Basic pipelining, branch prediction
- Lecture 16 - Basic pipelining, branch prediction
- Lecture 17 - Basic pipelining, branch prediction
- Lecture 18 - Basic pipelining, branch prediction
- Lecture 19 - Basic pipelining, branch prediction
- Lecture 20 - Dynamic scheduling, speculative execution
- Lecture 21 - Dynamic scheduling, speculative execution
- Lecture 22 - Dynamic scheduling, speculative execution
- Lecture 23 - Dynamic scheduling, speculative execution
- Lecture 24 - Dynamic scheduling, speculative execution
- Lecture 25 - Virtual memory and caches
- Lecture 26 - Virtual memory and caches
- Lecture 27 - Virtual memory and caches
- Lecture 28 - Topics in memory system, DRAM and SRAM technology
- Lecture 29 - Topics in memory system, DRAM and SRAM technology

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Topics in memory system, DRAM and SRAM technology
- Lecture 31 - Case study
- Lecture 32 - Case study
- Lecture 33 - Case study
- Lecture 34 - Case study
- Lecture 35 - Input/Output
- Lecture 36 - Simultaneous multithreading, multi-cores



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Compiler Design (Prof. Sanjeev K Aggarwal)

Subject Co-ordinator - Prof. Sanjeev K Aggarwal

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Compiler Design  
Lecture 2 - Compiler Design  
Lecture 3 - Compiler Design  
Lecture 4 - Compiler Design  
Lecture 5 - Compiler Design  
Lecture 6 - Compiler Design  
Lecture 7 - Compiler Design  
Lecture 8 - Compiler Design  
Lecture 9 - Compiler Design  
Lecture 10 - Compiler Design  
Lecture 11 - Compiler Design  
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Lecture 26 - Compiler Design  
Lecture 27 - Compiler Design  
Lecture 28 - Compiler Design  
Lecture 29 - Compiler Design  
Lecture 30 - Compiler Design

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to programming in C

Subject Co-ordinator - Prof. Satyadev Nandakumar

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Intro - Process of programming  
Lecture 2 - Intro - GCD  
Lecture 3 - Intro - Programming cycle  
Lecture 4 - Intro - Tracing a simple program  
Lecture 5 - Intro - Variables  
Lecture 6 - Intro - Operators  
Lecture 7 - Loops - While  
Lecture 8 - Loops - While example  
Lecture 9 - Loops - While GCD example  
Lecture 10 - Loops - Longest 1  
Lecture 11 - Loops - Longest 2  
Lecture 12 - Loops - Longest 3  
Lecture 13 - Loops - Do-while  
Lecture 14 - Loops - Matrix using nested loops  
Lecture 15 - Loops - For  
Lecture 16 - Loops - Matrix using nested for loops  
Lecture 17 - Loops - Break statement  
Lecture 18 - Loops - Continue statement  
Lecture 19 - Loops - Continue statement example  
Lecture 20 - Data types in C  
Lecture 21 - ASCII code  
Lecture 22 - Operators Expressions Associativity  
Lecture 23 - Precedence of operators  
Lecture 24 - Expression evaluation  
Lecture 25 - Functions - Introduction  
Lecture 26 - Functions - How functions are executed  
Lecture 27 - Functions - Examples - 1  
Lecture 28 - Functions - Examples - 2  
Lecture 29 - Arrays in C

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Initializing arrays
- Lecture 31 - Initializing character arrays
- Lecture 32 - Pointers in C
- Lecture 33 - Pointer arithmetic
- Lecture 34 - Function with pointer arguments
- Lecture 35 - Example - copy a subarray
- Lecture 36 - Programming using arrays and pointers
- Lecture 37 - sizeof operator
- Lecture 38 - Returning pointers from functions
- Lecture 39 - Example - return duplicate of a string
- Lecture 40 - Recursion - Linear Recursion
- Lecture 41 - Recursion - Linear Recursion - 2
- Lecture 42 - Recursion - Two-way Recursion
- Lecture 43 - Multidimensional Arrays
- Lecture 44 - Multidimensional Arrays and Pointers
- Lecture 45 - Multidimensional Arrays and Pointers - continued (2)
- Lecture 46 - Multidimensional Arrays and Pointers - continued (3)
- Lecture 47 - File Handling
- Lecture 48 - Some other file-handling functions
- Lecture 49 - Structures in C - 1
- Lecture 50 - Structures in C - 2
- Lecture 51 - Singly Linked Lists
- Lecture 52 - Doubly Linked Lists - introduction
- Lecture 53 - Organizing code into multiple files - 1
- Lecture 54 - Organizing code into multiple files - 2
- Lecture 55 - Pre and post increment

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Fundamentals of Database Systems

Subject Co-ordinator - Dr. Arnab Bhattacharya

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Databases  
Lecture 2 - Relational Data Model  
Lecture 3 - Relational Algebra Basic Operators  
Lecture 4 - Relational Algebra Composition of Operators  
Lecture 5 - Relational Algebra Additional Operators  
Lecture 6 - Relational Algebra Extended Relational Algebra  
Lecture 7 - Relational Algebra  
Lecture 8 - SQL  
Lecture 9 - SQL  
Lecture 10 - SQL  
Lecture 11 - SQL  
Lecture 12 - Normalization Theory  
Lecture 13 - Normalization Theory  
Lecture 14 - Normalization Theory  
Lecture 15 - Normalization Theory  
Lecture 16 - Normalization Theory  
Lecture 17 - Physical Design  
Lecture 18 - Database Indexing  
Lecture 19 - Database Indexing  
Lecture 20 - Query Processing  
Lecture 21 - Query Processing  
Lecture 22 - Query Processing  
Lecture 23 - Query Processing  
Lecture 24 - Query Optimization  
Lecture 25 - Query Optimization  
Lecture 26 - Query Optimization  
Lecture 27 - Query Optimization  
Lecture 28 - Database Transactions  
Lecture 29 - Database Transactions

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Recovery Systems
- Lecture 31 - Recovery Systems
- Lecture 32 - Recovery Systems
- Lecture 33 - Schedules
- Lecture 34 - Schedules
- Lecture 35 - Schedules
- Lecture 36 - Schedules
- Lecture 37 - Schedules
- Lecture 38 - Concurrency Control
- Lecture 39 - Concurrency Control
- Lecture 40 - Concurrency Control
- Lecture 41 - Concurrency Control
- Lecture 42 - Concurrency Control
- Lecture 43 - Concurrency Control
- Lecture 44 - Concurrency Control
- Lecture 45 - NoSQL
- Lecture 46 - NoSQL
- Lecture 47 - NoSQL
- Lecture 48 - Big Data

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Theory of Computation

Subject Co-ordinator - Prof. Raghunath Tewari

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Finite Automata
- Lecture 2 - Basic Notation and Convention, DFA Edit Lesson
- Lecture 3 - Example of DFAs
- Lecture 4 - Computation by DFA and Regular operation
- Lecture 5 - Introduction to Nondeterminism
- Lecture 6 - NFA, definition and examples
- Lecture 7 - Equivalence of NFA and DFA, Closure properties
- Lecture 8 - Regular expressions
- Lecture 9 - Algebraic properties, RE to NFA conversion
- Lecture 10 - GNFA to RE conversion
- Lecture 11 - More closure properties of regular languages
- Lecture 12 - Non-regular languages and pumping lemma
- Lecture 13 - Examples of non-regular languages
- Lecture 14 - DFA minimization
- Lecture 15 - Introduction to CFGs
- Lecture 16 - Examples of CFGs, Reg subset of CFL
- Lecture 17 - Parse tree, derivation, ambiguity
- Lecture 18 - Normal forms, Chomsky normal form
- Lecture 19 - Non-CFLs, pumping lemma
- Lecture 20 - Examples of non- CFLs
- Lecture 21 - Pushdown Automata
- Lecture 22 - Pushdown Automata - Definition and Example
- Lecture 23 - Pushdown Automata - Examples and Relation with CFGs
- Lecture 24 - Closure Properties of CFLs
- Lecture 25 - Deterministic Context Free Languages
- Lecture 26 - Turing Machine
- Lecture 27 - More on Turing Machine
- Lecture 28 - Non deterministic Turing Machine Edit Lesson
- Lecture 29 - Configuration Graphs

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Closure Properties of Decidable and Turing recognizable languages
- Lecture 31 - Decidability properties of Regular and Context Free Languages
- Lecture 32 - Undecidability
- Lecture 33 - More on Undecidability
- Lecture 34 - Reduction
- Lecture 35 - Applications of Reduction
- Lecture 36 - Rice's theorem
- Lecture 37 - Introduction to Computational Complexity Theory
- Lecture 38 - More on the class NP
- Lecture 39 - NP-Completeness
- Lecture 40 - More on NP-Completeness

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Modern Algebra

Subject Co-ordinator - Prof. Manindra Agrawal

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Groups  
Lecture 2 - Groups  
Lecture 3 - Groups  
Lecture 4 - Groups  
Lecture 5 - Groups  
Lecture 6 - Groups  
Lecture 7 - Rings  
Lecture 8 - Rings  
Lecture 9 - Rings  
Lecture 10 - Rings  
Lecture 11 - Rings  
Lecture 12 - Rings  
Lecture 13 - Rings  
Lecture 14 - Fields  
Lecture 15 - Cauchy sequences and real numbers  
Lecture 16 - Properties of Fields  
Lecture 17 - Finite Fields  
Lecture 18 - Application of Fields

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Advanced Graph Theory

Subject Co-ordinator - Dr.Rajiv Misra

Co-ordinating Institute - IIT - Patna

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Graph Theory
- Lecture 2 - Paths, Cycles and Trails
- Lecture 3 - Eulerian Circuits, Vertex Degrees and Counting
- Lecture 4 - The Chinese Postman Problem and Graphic Sequences
- Lecture 5 - Trees and Distance
- Lecture 6 - Spanning Trees and Enumeration
- Lecture 7 - Matchings and Covers
- Lecture 8 - Independent Sets, Covers and Maximum Bipartite Matching
- Lecture 9 - Weighted Bipartite Matching
- Lecture 10 - Stable Matchings and Faster Bipartite Matching
- Lecture 11 - Factors and Perfect Matching in General Graphs
- Lecture 12 - Matching in General Graphs
- Lecture 13 - Connectivity and Paths
- Lecture 14 - k-Connected Graphs
- Lecture 15 - Network Flow Problems
- Lecture 16 - Vertex Coloring and Upper Bounds
- Lecture 17 - Brooks's Theorem and Color-Critical Graphs
- Lecture 18 - Counting Proper Colorings
- Lecture 19 - Planar Graphs
- Lecture 20 - Characterization of Planar Graphs
- Lecture 21 - Line Graphs and Edge-coloring
- Lecture 22 - Hamiltonian Graph, Traveling Salesman Problem and NP-Completeness
- Lecture 23 - Connected Dominating Set and Distributed Algorithm

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Cloud Computing and Distributed Systems

Subject Co-ordinator - Dr.Rajiv Misra

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Cloud Computing
- Lecture 2 - Virtualization
- Lecture 3 - Hotspot Mitigation for Virtual Machine Migration
- Lecture 4 - Server Virtualization
- Lecture 5 - Software Defined Network
- Lecture 6 - Geo-distributed Cloud Data Centers
- Lecture 7 - Leader Election in Rings (Classical Distributed Algorithms)
- Lecture 8 - Leader Election (Ring LE and Bully LE Algorithm)
- Lecture 9 - Design of Zookeeper
- Lecture 10 - Time and Clock Synchronization in Cloud Data Centers
- Lecture 11 - Global State and Snapshot Recording Algorithms
- Lecture 12 - Distributed Mutual Exclusion
- Lecture 13 - Consensus in Cloud Computing and Paxos
- Lecture 14 - Byzantine Agreement
- Lecture 15 - Failures and Recovery Approaches in Distributed Systems
- Lecture 16 - Design of Key-Value Stores
- Lecture 17 - Design of HBase
- Lecture 18 - Peer to Peer Systems in Cloud Computing
- Lecture 19 - MapReduce
- Lecture 20 - Introduction to Spark
- Lecture 21 - Introduction to Kafka

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# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Big Data Computing

Subject Co-ordinator - Dr. Rajiv Misra

Co-ordinating Institute - IIT - Patna

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Big Data  
Lecture 2 - Big Data Enabling Technologies  
Lecture 3 - Hadoop Stack for Big Data  
Lecture 4 - Hadoop Distributed File System (HDFS)  
Lecture 5 - Hadoop MapReduce 1.0  
Lecture 6 - Hadoop MapReduce 2.0 - Part I  
Lecture 7 - Hadoop MapReduce 2.0 - Part II  
Lecture 8 - MapReduce Examples  
Lecture 9 - Parallel Programming with Spark  
Lecture 10 - Introduction to Spark  
Lecture 11 - Spark Built-in Libraries  
Lecture 12 - Design of Key-Value Stores  
Lecture 13 - Data Placement Strategies  
Lecture 14 - CAP Theorem  
Lecture 15 - Consistency Solutions  
Lecture 16 - Design of Zookeeper  
Lecture 17 - CQL (Cassandra Query Language)  
Lecture 18 - Design of HBase  
Lecture 19 - Spark Streaming and Sliding Window Analytics - Part I  
Lecture 20 - Spark Streaming and Sliding Window Analytics - Part II  
Lecture 21 - Sliding Window Analytics  
Lecture 22 - Introduction to Kafka  
Lecture 23 - Big Data Machine Learning - Part I  
Lecture 24 - Big Data Machine Learning - Part II  
Lecture 25 - Machine Learning Algorithm K-means using Map Reduce for Big Data Analytics  
Lecture 26 - Parallel K-means using Map Reduce on Big Data Cluster Analysis  
Lecture 27 - Decision Trees for Big Data Analytics  
Lecture 28 - Big Data Predictive Analytics - Part I  
Lecture 29 - Big Data Predictive Analytics - Part II

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Parameter Servers
- Lecture 31 - PageRank Algorithm in Big Data
- Lecture 32 - Spark GraphX and Graph Analytics - Part I
- Lecture 33 - Spark GraphX and Graph Analytics - Part II
- Lecture 34 - Case Study

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Blockchain Technology and Applica

Subject Co-ordinator - Prof. Sandeep Shukla

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1  
Lecture 2  
Lecture 3  
Lecture 4  
Lecture 5  
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Lecture 26  
Lecture 27  
Lecture 28  
Lecture 29

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Arithmetic Circuit Complexity

Subject Co-ordinator - Prof. Nitin Saxena

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Turing Machines and Introduction to Arithmetic Circuits
- Lecture 2 - Arithmetic complexity classes
- Lecture 3 - Determinant is in VP
- Lecture 4 - Determinant vs Arithmetic Branching Programs (ABP)
- Lecture 5 - Determinant as signed sum of cflow sequence
- Lecture 6 - Determinant has small ABP and Strassen's homogenization
- Lecture 7 - Depth reduction for arithmetic formulas
- Lecture 8 - Depth reduction for arithmetic circuits
- Lecture 9 - Depth 4 reduction
- Lecture 10 - Depth 3 reduction
- Lecture 11 - Equivalence of Formulas and Width 3 ABP
- Lecture 12 - Width-2 ABP Chasm
- Lecture 13 - Grigoriev-Karpinski Measure
- Lecture 14 - Lower Bound of Depth-3 circuit over finite fields
- Lecture 15 - Lower Bound for depth 3 Multilinear Circuits
- Lecture 16 - Lower Bound for Constant depth Multilinear Circuits
- Lecture 17 - Structural lemma for constant depth multilinear circuits
- Lecture 18 - Extending the proof for multilinear formulas
- Lecture 19 - Shifted Partial Derivative Measure
- Lecture 20 - Exponential Lower Bound for General depth-4 Circuits
- Lecture 21 - Lower Bound on Homogeneous Depth-4 circuits
- Lecture 22 - Introduction to PIT
- Lecture 23 - Hitting Set and Hitting Set Generator
- Lecture 24 - PIT vs Lower Bounds

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computational Complexity Theory

Subject Co-ordinator - Prof. Raghunath Tewari

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - NP Completeness
- Lecture 3 - SAT is NP-complete
- Lecture 4 - More on NP completeness
- Lecture 5 - Hierarchy Theorems
- Lecture 6 - Introduction to Space Complexity
- Lecture 7 - Savitch's Theorem
- Lecture 8 - Immerman-Szelepcsenyi Theorem
- Lecture 9 - Polynomial Hierarchy
- Lecture 10 - A PSPACE Complete Problem
- Lecture 11 - More on Polynomial Hierarchy
- Lecture 12 - Alternating Turing Machines
- Lecture 13 - Equivalence of Quantifier and Oracle Based Definitions of Polynomial Hierarchy
- Lecture 14 - Boolean Circuits
- Lecture 15 - Shannon's Theorem and Karp-Lipton-Sipser Theorem
- Lecture 16 - Bounded Depth Circuit Classes
- Lecture 17 - Kannan's Theorem
- Lecture 18 - Probabilistic Complexity
- Lecture 19 - StrongBPP and WeakBPP
- Lecture 20 - One-sided and Zero-sided Error Probabilistic Complexity Classes
- Lecture 21 - Error Reduction for BPP
- Lecture 22 - BPP in PH and Logspace Randomized Classes
- Lecture 23 - Valiant-Vazirani Theorem - I
- Lecture 24 - Valiant-Vazirani Theorem - II
- Lecture 25 - Amplified version of Valiant-Vazirani Theorem
- Lecture 26 - Toda's Theorem - I
- Lecture 27 - Toda's Theorem - II
- Lecture 28 - Permanent and Determinant Functions
- Lecture 29 - Permanent is hard for #P

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Interactive Proofs
- Lecture 31 - Graph Non-Isomorphism is in IP[2]
- Lecture 32 - Set Lower Bound Protocol
- Lecture 33 - MA is in AM
- Lecture 34 - Sumcheck Protocol - I
- Lecture 35 - Sumcheck Protocol - II
- Lecture 36 - Parity not in AC0 - I
- Lecture 37 - Parity not in AC0 - II
- Lecture 38 - Circuits with Counters
- Lecture 39 - Communication Complexity - I
- Lecture 40 - PCP Theorem
- Lecture 41 - Communication Complexity - II



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Randomized Methods in Complexity

Subject Co-ordinator - Prof. Nitin Saxena

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Course Outline
- Lecture 2 - Circuits and Polynomial Identity Testing
- Lecture 3 - Derandomization and Lower Bounds
- Lecture 4 -  $IP=PSPACE$
- Lecture 5 - ACC0 Lower Bounds
- Lecture 6 - ACC0 Lower Bounds (Continued...)
- Lecture 7 - Monotone Circuits
- Lecture 8 - Monotone Circuit Lower Bound and Sunflower Lemma
- Lecture 9 - Undirected Graph Connectivity in randomized logspace
- Lecture 10 - Graph Expansion Properties
- Lecture 11 - Expanders
- Lecture 12 - Error Reduction using Expanders
- Lecture 13 - Ajtai-Komlos-Szemerédi Theorem
- Lecture 14 - Explicit construction of expanders and Zig-Zag product
- Lecture 15 - Spectral analysis of Zig-Zag product
- Lecture 16 - Undirected Path in logspace
- Lecture 17 - Explicit Prg to derandomizing classes
- Lecture 18 - Hardness vs Randomness
- Lecture 19 - Hardness to NW-Generator to PRG
- Lecture 20 - Partial derandomization from worst-case hardness of permanent
- Lecture 21 - Error-correcting codes
- Lecture 22 - Introduction to various linear explicit codes
- Lecture 23 - Introduction of efficient decoding
- Lecture 24 - Local decoding of WH, Reed-Muller and Concatenated codes
- Lecture 25 - Introduction to List Decoding
- Lecture 26 - Local List decoding of WH, RM

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Probability for Computer Science

Subject Co-ordinator - Prof. Nitin Saxena

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introductory examples
- Lecture 2 - Examples and Course outline
- Lecture 3 - Probability over discrete space
- Lecture 4 - Inclusion-Exclusion principle
- Lecture 5 - Probability over infinite space
- Lecture 6 - Conditional probability, Partition formula
- Lecture 7 - Independent events, Bayes theorem
- Lecture 8 - Fallacies, Random variables
- Lecture 9 - Expectation
- Lecture 10 - Conditional Expectation
- Lecture 11 - Important Random Variables
- Lecture 12 - Continuous Random Variables
- Lecture 13 - Equality Checking, Poisson Distribution
- Lecture 14 - Concentration Inequalities, Variance
- Lecture 15 - Weak Linearity of Variance, Law of Large Numbers
- Lecture 16 - Chernoff's Bound. K-wise Independence
- Lecture 17 - Union and Factorial Estimates
- Lecture 18 - Stochastic Process: Markov Chains
- Lecture 19 - Drunkard's walk, Evolution of Markov Chains
- Lecture 20 - Stationary Distribution
- Lecture 21 - Perron-Frobenius Theorem, Page Rank Algorithm
- Lecture 22 - Page Rank Algorithm: Ergodicity
- Lecture 23 - Cell Genetics
- Lecture 24 - Random Sampling
- Lecture 25 - Biased Coin Tosses, Hashing
- Lecture 26 - Hashing, Introduction to Probabilistic Methods
- Lecture 27 - Ramsey Numbers, Large Cuts in Graphs
- Lecture 28 - Sum Free Subsets, Discrepancy
- Lecture 29 - Extremal Set Families

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 30 - Super Concentrators

Lecture 31 - Streaming Algorithms - I

Lecture 32 - Streaming Algorithms - II

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Circuit Complexity Theory

Subject Co-ordinator - Prof. Raghunath Tewari

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Standard Bounds
- Lecture 3 - Shannon's Theorem
- Lecture 4 - Riordon-Shannon Theorem
- Lecture 5 - Khrapchenko's Theorem
- Lecture 6 - Proof of Khrapchenko's Theorem
- Lecture 7 - Application of Khrapchenko's Theorem
- Lecture 8 - Nechiporuk's Theorem
- Lecture 9 - Application of Nechiporuk's Theorem
- Lecture 10 - Subbotovskaya's Theorem - I
- Lecture 11 - Subbotovskaya's Theorem - II
- Lecture 12 - Applications of Subbotovskaya's Theorem
- Lecture 13 - Upper and Lower Bounds on the Andreev Function
- Lecture 14 - Upper and Lower Bounds on the Andreev Function
- Lecture 15 - Polynomial Size Monotone Formula for MAJORITY (Valiant's Theorem) - II
- Lecture 16 - Circuits for Addition - Ripple Adder and Carry Lookahead Adder
- Lecture 17 - Circuits for Addition - Parallel Prefix Sum Method
- Lecture 18 - Circuits for Iterated Addition and Multiplication
- Lecture 19 - Bounded Depth Circuit Classes
- Lecture 20 - Basic Circuit for Division using Newton-Raphson Method
- Lecture 21 - Division in  $NC_1$  (Beame, Cook, Hoover Theorem) - I
- Lecture 22 - Division in  $NC_1$  (Beame, Cook, Hoover Theorem) - II
- Lecture 23 - Division in  $NC_1$  (Beame, Cook, Hoover Theorem) - III
- Lecture 24 - Division in  $NC_1$  (Beame, Cook, Hoover Theorem) - IV
- Lecture 25 - Division in  $NC_1$  (Beame, Cook, Hoover Theorem) - V
- Lecture 26 - Division in  $NC_1$  (Beame, Cook, Hoover Theorem) - VI
- Lecture 27 - Relation between Bounded Depth Circuit Classes and Uniform Complexity Classes - I
- Lecture 28 - Relation between Bounded Depth Circuit Classes and Uniform Complexity Classes - II
- Lecture 29 - Reducing Circuit Depth

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - P is in P/poly
- Lecture 31 - Discussion on Lower Circuit Bounds for Bounded Depth Circuit Classes
- Lecture 32 - Monotone Circuit Lower Bound for Clique (Razborov's Theorem) - I
- Lecture 33 - Monotone Circuit Lower Bound for Clique (Razborov's Theorem) - II
- Lecture 34 - Monotone Circuit Lower Bound for Clique (Razborov's Theorem) - III
- Lecture 35 - Monotone Circuit Lower Bound for Clique (Razborov's Theorem) - IV
- Lecture 36 - Monotone Circuit Lower Bound for Clique (Razborov's Theorem) - V
- Lecture 37 - Monotone Circuit Lower Bound for Clique (Razborov's Theorem) - VI
- Lecture 38 - Circuit Lower Bound for Parity by Approximating Circuits using Polynomials (Razborov-Smolensky Theorem) - I
- Lecture 39 - Circuit Lower Bound for Parity by Approximating Circuits using Polynomials (Razborov-Smolensky Theorem) - II
- Lecture 40 - Circuit Lower Bound for Parity by Approximating Circuits using Polynomials (Razborov-Smolensky Theorem) - III
- Lecture 41 - Circuit Lower Bound for Parity using Switching Lemma (Hastad's Theorem)
- Lecture 42 - Circuit Lower Bound for Parity using Switching Lemma (Hastad's Theorem)
- Lecture 43 - Circuit Lower Bound for Parity using Switching Lemma (Hastad's Theorem)
- Lecture 44 - Proof of Hastad's Switching Lemma - I
- Lecture 45 - Proof of Hastad's Switching Lemma - II
- Lecture 46 - Communication Complexity of a Function
- Lecture 47 - Relation Between Communication Complexity and Circuit Depth (Karchmer-Wigderson Theorem) - I
- Lecture 48 - Relation Between Communication Complexity and Circuit Depth (Karchmer-Wigderson Theorem) - II
- Lecture 49 - Bounded Width Branching Programs = NC1 (Barrington's Theorem) - I
- Lecture 50 - Bounded Width Branching Programs = NC1 (Barrington's Theorem) - II
- Lecture 51 - Width 3 Branching Programs = MOD3 o MOD2 Circuits (Barrington's Theorem) - I
- Lecture 52 - Width 3 Branching Programs = MOD3 o MOD2 Circuits (Barrington's Theorem) - II
- Lecture 53 - Uniform AC0 can be simulated by depth 3 Threshold circuits of quasipolynomial size (Allender-Hertrich)
- Lecture 54 - Uniform AC0 can be simulated by depth 3 Threshold circuits of quasipolynomial size (Allender-Hertrich)
- Lecture 55 - Valiant-Vazirani Theorem - I
- Lecture 56 - Valiant-Vazirani Theorem - II
- Lecture 57 - Natural Proof Barrier (Razborov-Rudich Theorem) - I
- Lecture 58 - Natural Proof Barrier (Razborov-Rudich Theorem) - II
- Lecture 59 - Pseudorandom Function Generator by Goldreich, Goldwasser and Micali - I
- Lecture 60 - Pseudorandom Function Generator by Goldreich, Goldwasser and Micali - II

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Foundation of Cloud IoT Edge ML

Subject Co-ordinator - Prof. Rajiv Misra

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Edge Computing

Lecture 2 - Introduction to Cloud

Lecture 3 - Introduction to IoT Platform

Lecture 4 - Time and Clock Synchronization in IoT

Lecture 5 - Enabling Intelligence at Edge Layer for IoT

Lecture 6 - ML-based Image Classifier at IoT-Edge

Lecture 7 - Introduction to Docker Containers and Kubernetes

Lecture 8 - ML based Predictive Maintenance at IoT Edge

Lecture 9 - Deep Reinforcement Learning for Cloud Edge

Lecture 10 - Deep Reinforcement Learning for Cloud Edge Example

Lecture 11 - Public Cloud Services Case Study of AWS Services

Lecture 12 - Mathematical formulations for task offloading in Edge Cloud

Lecture 13 - Task Offloading Based on LSTM Prediction and Deep Reinforcement Learning

Lecture 14 - Vertical and Horizontal Offloading for Cloud Edge

Lecture 15 - Global State and Snapshot Recording Algorithms

Lecture 16 - Hot Data Analytics for Real Time Streaming in IoT Platform

Lecture 17 - Introduction to MQTT and Kafka in IoT Platform

Lecture 18 - Introduction to Edge Data Center for IoT Platform

Lecture 19 - Design of Key Value Stores for IoT Edge Storage

Lecture 20 - Introduction to Edge ML with AWS IoT platform

Lecture 21 - Introduction to Federated Learning at IoT Edge

Lecture 22 - ML for Autonomous Driving Car

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Linear Programming and its Applications to Comput

Subject Co-ordinator - Prof. Rajat Mittal

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Linear Programming, an Example
- Lecture 2 - Introduction to Linear Programming
- Lecture 3 - Gaussian Elimination with Examples
- Lecture 4 - Summary of Gaussian Elimination
- Lecture 5 - Vector Space over real numbers
- Lecture 6 - Linear Operators
- Lecture 7 - Solutions of Linear Equations
- Lecture 8 - Resource Allocation as LP
- Lecture 9 - Approximate Degree as LP
- Lecture 10 - Equivalent LP's
- Lecture 11 - Introduction to Convexity
- Lecture 12 - Different Kind of Convex Sets
- Lecture 13 - Feasible Region of LP
- Lecture 14 - Proof of Weyl's Theorem
- Lecture 15 - Definition of Convex Functions
- Lecture 16 - Properties of Convex Functions and Examples
- Lecture 17 - Basic Feasible Solution
- Lecture 18 - BFS and Vertices
- Lecture 19 - Simplex Algorithm
- Lecture 20 - Details of Simplex Algorithm
- Lecture 21 - Starting BFS
- Lecture 22 - Degeneracy
- Lecture 23 - Introduction to Duality
- Lecture 24 - Hyperplane Separation Theorems
- Lecture 25 - Farkas Lemma
- Lecture 26 - How to take dual
- Lecture 27 - Examples of taking dual
- Lecture 28 - Strong Duality
- Lecture 29 - Proof of Strong Duality

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Complementary Slackness
- Lecture 31 - Introduction to Algorithmic Game Theory
- Lecture 32 - Nash Equilibrium
- Lecture 33 - Minimax and Nash Equilibrium
- Lecture 34 - Deterministic Communication Complexity
- Lecture 35 - Randomized Communication Complexity
- Lecture 36 - Yao's Minimax Theorem
- Lecture 37 - Lower bounds using Yao's Minimax
- Lecture 38 - Set Disjointness Problem
- Lecture 39 - LP for mass flow problem
- Lecture 40 - LP for min cut problem
- Lecture 41 - Max flow = Min cut
- Lecture 42 - Primal dual approach
- Lecture 43 - Primal dual for max flow
- Lecture 44 - Set cover problem
- Lecture 45 - Rounding for set cover
- Lecture 46 - Analysis of Rounding
- Lecture 47 - Algorithm for Set Cover
- Lecture 48 - Linear Regression through LP
- Lecture 49 - Linear Classifiers through LP



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Basics of Computational Complexity

Subject Co-ordinator - Prof. Nitin Saxena

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Outline
- Lecture 3 - Formalize Problems and Machines
- Lecture 4 - Turing Machine
- Lecture 5 - Asymptotics, Church-Turing Thesis and UTM
- Lecture 6 - Halting Problem and Diagonalization
- Lecture 7 - Classes P, NP, EXP
- Lecture 8 - Comparison of Classes and Non-determination
- Lecture 9 - NP Vs Ntime
- Lecture 10 - SAT is NP-hard
- Lecture 11 - Cook-Levin Theorem
- Lecture 12 - NP-Hardness and Co-Classes
- Lecture 13 - NEXP and Godel's Computation Question
- Lecture 14 - Time, Space Hierarchy
- Lecture 15 - NDTM Hierarchy
- Lecture 16 - Ladner's Theorem and Introduction to Oracles
- Lecture 17 - Oracle and Relativizing Proofs
- Lecture 18 - Non Relativizing P=NP and Introduction to Space Complexity
- Lecture 19 - PSpace Completeness
- Lecture 20 - QBF Game and NSpace
- Lecture 21 - NL Complete
- Lecture 22 - NL = coNL
- Lecture 23 - Polynomial Hierarchy
- Lecture 24 - Polynomial Hierarchy
- Lecture 25 - PH Complete and Oracle TM
- Lecture 26 -  $NP^{NP}$  and #SAT
- Lecture 27 - Counting Classes #P and PP
- Lecture 28 - Permanent and its Cycle cover of a Graph
- Lecture 29 - #P-Complete: Graph Gadgets

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - #P-Hard: Analyse XOR
- Lecture 31 - Valient-Vazirani Lemma and Hashing
- Lecture 32 - SAT to Parity-SAT
- Lecture 33 - Parity Quantification
- Lecture 34 - Randomized Reduction of PH to Parity-P
- Lecture 35 - PH to #P
- Lecture 36 - Probabilistic TM
- Lecture 37 - Example of PTM and Introduction to RP and ZPP
- Lecture 38 - ZPP = RP and coRP
- Lecture 39 - Probability Amplification
- Lecture 40 - BPP in PH
- Lecture 41 - GNI is in BP.NP
- Lecture 42 - GI is NP-hard
- Lecture 43 - GI is NP-hard (Continued...) Going Beyond TMs
- Lecture 44 - Circuit Complexity
- Lecture 45 - TM with Advice - P/poly
- Lecture 46 - Circuits for NP and EXP
- Lecture 47 - Parallel Computation
- Lecture 48 - P-completeness and NEXP-completeness

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Edge Computing

Subject Co-ordinator - Multi-Faculty

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Overview of Cloud Computing

Lecture 2 - Cloud Computing and its Limitation to Support Low Latency and RTT

Lecture 3 - Introduction to Edge Computing

Lecture 4 - Edge Computing Paradigms - 004

Lecture 5 - Overview of Virtualization

Lecture 6 - Docker Containers

Lecture 7 - Kubernetes

Lecture 8 - NoSQL Databases and Key Value Stores

Lecture 9 - Edge AI Intelligence at the Edge

Lecture 10 - Edge AI Intelligence at the Edge

Lecture 11 - Mobile Edge Computing

Lecture 12 - Geo-distributed Data Centers

Lecture 13 - Time and Clock Synchronization

Lecture 14 - Edge Computing Security and Privacy

Lecture 15 - Network Virtualization

Lecture 16 - Resource Allocation in Private and Public Edge-Cloud Systems

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Practical Cyber Security for Cyber Security Pract

Subject Co-ordinator - Prof. Sandeep K. Shukla

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to the Course - Practical Cyber Security for Cyber Practitioners
- Lecture 2 - Introduction to Cyber Kill Chains - Lockheed Martin Kill Chain
- Lecture 3 - Understanding Cyber Kill Chain - Delivery, Exploitation, and Installation
- Lecture 4 - Mastering the Cyber Kill Chain: Command and Control and Actions on Objectives
- Lecture 5 - Introduction to MITRE ATT&CK framework
- Lecture 6 - Understanding MITRE ATT&CK: A Guide to Cyber Threat Intelligence
- Lecture 7 - Mapping to ATT&CK from Finished Cyber Incident
- Lecture 8 - Introduction to Mapping to ATT&CK from Raw Data
- Lecture 9 - Mapping to ATT&CK from RAW Data
- Lecture 10 - Storing and Analyzing ATT&CK-Mapped Data
- Lecture 11 - Making Defensive Recommendations from ATT&CK-Mapped Data
- Lecture 12 - TTP Mapping and Introduction to Unified Kill Chain
- Lecture 13 - Deep Dive into Unified Kill Chain - Part 1
- Lecture 14 - Deep Dive into Unified Kill Chain - Part 2
- Lecture 15 - Introduction to MITRE DEF3ND Framework
- Lecture 16 - Deep dive into MITRE DEF3ND framework - I
- Lecture 17 - Deep dive into MITRE DEF3ND framework - II
- Lecture 18 - MITRE DEF3ND Framework Conclusion and Introduction to Risk Identification and Assessment
- Lecture 19 - Deep dive into Risk Assessment - I
- Lecture 20 - Deep dive into Risk Assessment - II
- Lecture 21 - Introduction to Cyber Crisis Management
- Lecture 22 - Cyber Crisis Conclusion and Introduction to Cyber Resilience
- Lecture 23 - Deep dive into Cyber Resilience - I
- Lecture 24 - Deep dive into Cyber Resilience - II
- Lecture 25 - Cyber Resilience Review (Self-Assessment)
- Lecture 26 - Cyber Threat Intelligence Sharing - STIX Tutorial - Part 1
- Lecture 27 - Cyber Threat Intelligence Sharing - STIX Tutorial - Part 2
- Lecture 28 - Introduction to SCAP, CVE and CCE
- Lecture 29 - Deep Dive into CVE, CCE, CPE, CVSS Scoring, XCCDF, OVAL Languages - Part 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 30  
Lecture 31

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computational Arithmetic - Geometry for Algebraic

Subject Co-ordinator - Prof. Nitin Saxena

Co-ordinating Institute - IIT - Kanpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Course outline and Fundamentals
- Lecture 2 - Ideals and Varieties
- Lecture 3 - Dimension of Varieties
- Lecture 4 - Projective varieties
- Lecture 5 - Morphisms and rational functions
- Lecture 6 - Local rings
- Lecture 7 - Rational maps and Birationality
- Lecture 8 - Tangent space and Singularities
- Lecture 9 - Resolution of singularities
- Lecture 10 - Discrete valuation rings
- Lecture 11 - Existence of nonsingular model
- Lecture 12 - Nonsingular curves
- Lecture 13 - Divisor on Curves
- Lecture 14 - Riemann-Roch Spaces - I
- Lecture 15 - Riemann-Roch Spaces - II
- Lecture 16 - Divisor Class Group
- Lecture 17 - Genus of a curve
- Lecture 18 - Riemann-Roch and Adeles
- Lecture 19 - Differentials and Riemann-Roch
- Lecture 20 - Canonical divisor and proof of Riemann-Roch
- Lecture 21 - Jacobian of a curve
- Lecture 22 - Zeta function of curves
- Lecture 23 - Functional equation and point counting
- Lecture 24 - Riemann hypothesis for curves
- Lecture 25 - Proof of RH for curves: Galois covers
- Lecture 26 - Proof of RH for curves II: Multilinear algebra
- Lecture 27 - Cohomological interpretation of zeta function

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Cryptography and Network Security

Subject Co-ordinator - Dr. Debdeep Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Overview on Modern Cryptography
- Lecture 3 - Introduction to Number Theory
- Lecture 4 - Probability and Information Theory
- Lecture 5 - Classical Cryptosystems
- Lecture 6 - Cryptanalysis of Classical Ciphers
- Lecture 7 - Shannons Theory
- Lecture 8 - Shannons Theory (Continued...1)
- Lecture 9 - Shannons Theory (Continued...2)
- Lecture 10 - Symmetric Key Ciphers
- Lecture 11 - Block Cipher Standards (DES)
- Lecture 12 - Block Cipher Standards (AES)
- Lecture 13 - Block Cipher Standards (AES) (Continued...)
- Lecture 14 - Linear Cryptanalysis
- Lecture 15 - Differential Cryptanalysis
- Lecture 16 - Few other Cryptanalytic Techniques
- Lecture 17 - Overview on S-Box Design Principles
- Lecture 18 - Modes of Operation of Block Ciphers
- Lecture 19 - Stream Ciphers
- Lecture 20 - Stream Ciphers (Continued...1)
- Lecture 21 - Stream Ciphers (Continued...2)
- Lecture 22 - Pseudorandomness
- Lecture 23 - Cryptographic Hash Functions
- Lecture 24 - Cryptographic Hash Functions (Continued...1)
- Lecture 25 - Cryptographic Hash Functions (Continued...2)
- Lecture 26 - Message Authentication Codes
- Lecture 27 - More Number Theoretic Results
- Lecture 28 - The RSA Cryptosystem
- Lecture 29 - Primality Testing

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Factoring Algorithms
- Lecture 31 - Some Comments on the Security of RSA
- Lecture 32 - Discrete Logarithm Problem (DLP)
- Lecture 33 - The Diffie-Hellman Problem and Security of ElGamal Systems
- Lecture 34 - An Introduction to Elliptic Curve Cryptography
- Lecture 35 - Application of Elliptic Curves to Cryptography
- Lecture 36 - Implementation of Elliptic Curve Cryptography
- Lecture 37 - Secret Sharing Schemes
- Lecture 38 - A Tutorial on Network Protocols
- Lecture 39 - System Security
- Lecture 40 - Firewalls and Intrusion Detection Systems
- Lecture 41 - Side Channel Analysis of Cryptographic Implementations



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - High Performance Computer Architecture

Subject Co-ordinator - Prof. Ajit Pal

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction & Course Outline  
Lecture 2 - Performance  
Lecture 3 - Instruction Set Architecture  
Lecture 4 - MIPS ISA and Processor  
Lecture 5 - MIPS ISA and Processor (Continued...)  
Lecture 6 - Pipelining - Introduction  
Lecture 7 - Instruction Pipelining  
Lecture 8 - Pipeline Hazards  
Lecture 9 - Data Hazards  
Lecture 10 - Software Pipelining  
Lecture 11 - In Quest of Higher ILP  
Lecture 12 - In Quest of Higher ILP (Continued...)  
Lecture 13 - Dynamic Instruction Scheduling  
Lecture 14 - Dynamic Instruction Scheduling (Continued...)  
Lecture 15 - Control Hazards  
Lecture 16 - Branch Prediction  
Lecture 17 - Branch Prediction (Continued...)  
Lecture 18 - Dynamic Instruction Scheduling with Branch Prediction  
Lecture 19 - Hardware-based Speculation  
Lecture 20 - Tutorial - I  
Lecture 21 - Hierarchical Memory Organization  
Lecture 22 - Hierarchical Memory Organization (Continued...1)  
Lecture 23 - Hierarchical Memory Organization (Continued...2)  
Lecture 24 - Hierarchical Memory Organization (Continued...3)  
Lecture 25 - Cache Optimization Techniques (Continued...1)  
Lecture 26 - Cache Optimization Techniques (Continued...2)  
Lecture 27 - Main Memory Organization  
Lecture 28 - Main Memory Optimizations  
Lecture 29 - Virtual Memory

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- Lecture 30 - Virtual Memory (Continued...)
- Lecture 31 - Virtual Machines
- Lecture 32 - Storage Technology
- Lecture 33 - Storage Technology (Continued...)
- Lecture 34 - Case Studies
- Lecture 35 - Case Studies (Continued...1)
- Lecture 36 - Case Studies (Continued...2)
- Lecture 37 - Multithreading & Multiprocessing
- Lecture 38 - Simultaneous Multithreading
- Lecture 39 - Symmetric Multiprocessors
- Lecture 40 - Distributed Memory Multiprocessors
- Lecture 41 - Cluster, Grid and Cloud Computing

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Low Power VLSI Circuits and Systems

Subject Co-ordinator - Prof. Ajit Pal

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction & Course Outline
- Lecture 2 - MOS Transistors - I
- Lecture 3 - MOS Transistors - II
- Lecture 4 - MOS Transistors - III
- Lecture 5 - MOS Transistors - IV
- Lecture 6 - MOS Inverters - I
- Lecture 7 - MOS Inverters - II
- Lecture 8 - MOS Inverters - III
- Lecture 9 - MOS Inverters - IV
- Lecture 10 - Static CMOS Circuits - I
- Lecture 11 - Static CMOS Circuits - II
- Lecture 12 - MOS Dynamic Circuits - I
- Lecture 13 - MOS Dynamic Circuits - II
- Lecture 14 - Pass Transistor Logic Circuits - I
- Lecture 15 - Pass Transistor Logic Circuits - II
- Lecture 16 - MOS Memories
- Lecture 17 - Finite State Machines
- Lecture 18 - Switching Power Dissipation
- Lecture 19 - Tutorial - I
- Lecture 20 - Dynamic Power Dissipation
- Lecture 21 - Leakage Power Dissipation
- Lecture 22 - Supply Voltage Scaling - I
- Lecture 23 - Supply Voltage Scaling - II
- Lecture 24 - Supply Voltage Scaling - III
- Lecture 25 - Supply Voltage Scaling - IV
- Lecture 26 - Tutorial - II
- Lecture 27 - Minimizing Switched Capacitance - I
- Lecture 28 - Minimizing Switched Capacitance - II
- Lecture 29 - Minimizing Switched Capacitance - III

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Minimizing Switched Capacitance - IV
- Lecture 31 - Minimizing Switched Capacitance - V
- Lecture 32 - Minimizing Leakage Power - I
- Lecture 33 - Minimizing Leakage Power - II
- Lecture 34 - Minimizing Leakage Power - III
- Lecture 35 - Variation Tolerant Design
- Lecture 36 - Adiabatic Logic Circuits
- Lecture 37 - Battery-Driven System Design
- Lecture 38 - CAD Tools for Low Power
- Lecture 39 - Tutorial - III
- Lecture 40 - Course Summary

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Real Time Systems

Subject Co-ordinator - Prof. Rajib Mall

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Real - Time System Characteristics
- Lecture 3 - Few Basic Issues
- Lecture 4 - Modelling Timing Constraints
- Lecture 5 - Modelling Timing Constraints (Continued.)
- Lecture 6 - Basics of Real - Time Task Scheduling
- Lecture 7 - Cyclic Scheduler
- Lecture 8 - Event - Driven Scheduling
- Lecture 9 - Rate Monotonic Scheduler
- Lecture 10 - RMA Scheduling
- Lecture 11 - Deadline Monotonic Scheduling and Other Issues
- Lecture 12 - Few Issues in Use of RMA
- Lecture 13 - Resource Sharing Among Real-Time Tasks
- Lecture 14 - Highest Locker and Priority Ceiling Protocols
- Lecture 15 - An Analysis of Priority Ceiling Protocol
- Lecture 16 - Handling Task Dependencies
- Lecture 17 - Real-Time Task Scheduling on Multiprocessors and Distributed Systems
- Lecture 18 - Real-Time Task Scheduling on Multiprocessors and Distributed Systems (Continued.)
- Lecture 19 - Clock Synchronization in Distributed Real-Time Systems
- Lecture 20 - Internal Clock Synchronization in Presence of Byzantine Clocks
- Lecture 21 - A Few Basic Issues in Real-Time Operating Systems
- Lecture 22 - Tutorial - I
- Lecture 23 - A Few Basic Issues in Real-Time Operating Systems (Continued.)
- Lecture 24 - Unix and Windows as RTOS
- Lecture 25 - Real - Time POSIX
- Lecture 26 - Real - Time POSIX (Continued.)
- Lecture 27 - Open Source and Commercial RTOS
- Lecture 28 - Open Source and Commercial RTOS (Continued.)
- Lecture 29 - Benchmarking Real - Time Computer & Operating Systems

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Benchmarking Real - Time Computer & Operating Systems (Continued.)
- Lecture 31 - Real - Time Communications
- Lecture 32 - Few Basic Issues in Real - Time Communications
- Lecture 33 - Review of Computer Networking
- Lecture 34 - Real - Time Communication in a LAN
- Lecture 35 - Real - Time Communication in a LAN (Continued.)
- Lecture 36 - Performance of Two Real -Time Communication Protocols
- Lecture 37 - Real - Time Communication over Packet Switched Networks
- Lecture 38 - Real - Time Communication over Packet Switched Networks (Continued.)
- Lecture 39 - Real - Time Communication over Packet Switched Networks (Continued.)
- Lecture 40 - Real - Time Databases

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Artificial Intelligence (Prof. Anupam Basu)

Subject Co-ordinator - Prof. Sudeshna Sarkar, Prof. Anupam Basu

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Artificial Intelligence  
Lecture 2 - Intelligent Agents  
Lecture 3 - State Space Search  
Lecture 4 - Uninformed Search  
Lecture 5 - Informed Search  
Lecture 6 - Informed Search - 2  
Lecture 7 - Two Players Games - I  
Lecture 8 - Two Players Games - II  
Lecture 9 - Constraint Satisfaction Problems - 1  
Lecture 10 - Constraint Satisfaction Problems - 2  
Lecture 11 - Knowledge Representation and Logic  
Lecture 12 - Interface in Propositional Logic  
Lecture 13 - First Order Logic  
Lecture 14 - Reasoning Using First Order Logic  
Lecture 15 - Resolution in FOPL  
Lecture 16 - Rule Based System  
Lecture 17 - Rule Based Systems II  
Lecture 18 - Semantic Net  
Lecture 19 - Reasoning in Semantic Net  
Lecture 20 - Frames  
Lecture 21 - Planning - 1  
Lecture 22 - Planning - 2  
Lecture 23 - Planning - 3  
Lecture 24 - Planning - 4  
Lecture 25 - Rule Based Expert System  
Lecture 26 - Reasoning with Uncertainty - I  
Lecture 27 - Reasoning with Uncertainty - II  
Lecture 28 - Reasoning with Uncertainty - III  
Lecture 29 - Reasoning with Uncertainty - IV

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Fuzzy Reasoning - I
- Lecture 31 - Fuzzy Reasoning - II
- Lecture 32 - Introduction to Learning - I
- Lecture 33 - Introduction to Learning - II
- Lecture 34 - Rule Induction and Decision Trees - I
- Lecture 35 - Rule Induction and Decision Trees - II
- Lecture 36 - Learning Using neural Networks - I
- Lecture 37 - Learning Using Neural Networks - II
- Lecture 38 - Probabilistic Learning
- Lecture 39 - Natural Language Processing - I
- Lecture 40 - Natural Language Processing - II



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Artificial Intelligence (Prof. P. Dasgupta)

Subject Co-ordinator - Prof. P. Dasgupta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Artificial Intelligence

Lecture 2 - Problem Solving by Search

Lecture 3 - Searching with Costs

Lecture 4 - Informed State Space Search

Lecture 5 - Heuristic Search

Lecture 6 - Problem Reduction Search

Lecture 7 - Searching Game Trees

Lecture 8 - Knowledge Based Systems

Lecture 9 - First Order Logic

Lecture 10 - Inference in First Order Logic

Lecture 11 - Resolution - Refutation Proofs

Lecture 12 - Resolution Refutation Proofs

Lecture 13 - Logic Programming

Lecture 14 - Prolog Programming

Lecture 15 - Prolog

Lecture 16 - Additional Topics

Lecture 17 - Introduction to Planning

Lecture 18 - Partial Order Planning

Lecture 19 - GraphPLAN and SATPlan

Lecture 20 - SATPlan

Lecture 21 - Reasoning under uncertainty

Lecture 22 - Bayesian Networks

Lecture 23 - Reasoning with Bayes Networks

Lecture 24 - Reasoning with Bayes networks (Contd.)

Lecture 25 - Reasoning under uncertainty

Lecture 26 - Learning

Lecture 27 - Learning

Lecture 28 - Back Propagation Learning

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# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Computer Networks

Subject Co-ordinator - Prof. Sujoy Ghosh

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Emergence of Networks & Reference Models  
Lecture 2 - Network Topology  
Lecture 3 - Physical Medium - I  
Lecture 4 - Physical Medium - II  
Lecture 5 - Multiplexing (Sharing a Medium)  
Lecture 6 - Telecom Networks  
Lecture 7 - Switches - I  
Lecture 8 - Pocket Switches  
Lecture 9 - SONET/SDH  
Lecture 10 - Fiber Optic Components  
Lecture 11 - Routing and Wavelength Assignment  
Lecture 12 - Protection and Restoration  
Lecture 13 - Multiple Access  
Lecture 14 - Token Based Mac  
Lecture 15 - Data Link Protocols  
Lecture 16 - Error Control  
Lecture 17 - Stop & Wait Protocol  
Lecture 18 - Satellite Communication  
Lecture 19 - Ethernet - CSMA/CD  
Lecture 20 - Modern Ethernet  
Lecture 21 - Local Internetworking  
Lecture 22 - Cellular Networks  
Lecture 23 - Wireless Network  
Lecture 24 - ATM  
Lecture 25 - ATM Signaling, Routing and LAN Emulation  
Lecture 26 - Introduction to Routing  
Lecture 27 - RIP - Distance Vector Routing  
Lecture 28 - IP version 4  
Lecture 29 - IP Version 6 & Mobile IP

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - UDP & Client Server
- Lecture 31 - TCP
- Lecture 32 - IP Multicasting
- Lecture 33 - DHCP and ICMP
- Lecture 34 - DNS & Directory
- Lecture 35 - Congestion Control
- Lecture 36 - QOS & Multimedia
- Lecture 37 - Network Management
- Lecture 38 - Security
- Lecture 39 - FTP - SMTP
- Lecture 40 - HTTP

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Data Communication

Subject Co-ordinator - Prof. Ajit Pal

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction and Course Outline - Data Communication

Lecture 2 - Layered Architecture

Lecture 3 - Data and Signal

Lecture 4 - Transmission Impairments and Channel Capacity

Lecture 5 - Guided Transmission Media

Lecture 6 - Unguided Media

Lecture 7 - Transmission of Digital Signal - I

Lecture 8 - Transmission of Digital Signal - II

Lecture 9 - Transmission of Analog Signal - I

Lecture 10 - Transmission of Analog Signal - II

Lecture 11 - Multiplexing

Lecture 12 - Multiplexing

Lecture 13 - Multiplexing Applications - I

Lecture 14 - Multiplexing Applications - II

Lecture 15 - Interfacing to the Media

Lecture 16 - Error Detection and Correction

Lecture 17 - Flow and Error Control

Lecture 18 - Data Link Control

Lecture 19 - Switching Techniques Circuit Switching

Lecture 20 - Switching Techniques Packet Switching

Lecture 21 - Routing - I

Lecture 22 - Routing - II

Lecture 23 - Congestion Control

Lecture 24 - X.25 and Frame Relay

Lecture 25 - ATM

Lecture 26 - Medium Access Control - I

Lecture 27 - Medium Access Control - II

Lecture 28 - Medium Access Control - III

Lecture 29 - IEEE 802 LANs

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - High Speed LANs
- Lecture 31 - Wireless LANs
- Lecture 32 - Cellular Telephone Systems
- Lecture 33 - Satellite Communications
- Lecture 34 - Internet and Internetworking
- Lecture 35 - TCP/IP - I
- Lecture 36 - TCP/IP - II
- Lecture 37 - Multimedia Networks
- Lecture 38 - Audio and Video Compression
- Lecture 39 - Multimedia Services
- Lecture 40 - Secured Communication - I
- Lecture 41 - Secured Communication - II

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Electronic Design Automation

Subject Co-ordinator - Prof. Indranil Sengupta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Verilog  
Lecture 3 - Verilog  
Lecture 4 - Verilog  
Lecture 5 - Verilog  
Lecture 6 - Verilog  
Lecture 7 - Verilog  
Lecture 8 - Synthesis  
Lecture 9 - Synthesis  
Lecture 10 - Synthesis  
Lecture 11 - Synthesis  
Lecture 12 - Synthesis  
Lecture 13 - Synthesis  
Lecture 14 - Synthesis  
Lecture 15 - Backend Design  
Lecture 16 - Backend Design  
Lecture 17 - Backend Design  
Lecture 18 - Backend Design  
Lecture 19 - Backend Design  
Lecture 20 - Backend Design  
Lecture 21 - Backend Design  
Lecture 22 - Backend Design  
Lecture 23 - Backend Design  
Lecture 24 - Backend Design  
Lecture 25 - Backend Design  
Lecture 26 - Backend Design  
Lecture 27 - Backend Design  
Lecture 28 - Backend Design  
Lecture 29 - Backend Design

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Testing Part - I
- Lecture 31 - Testing Part - II
- Lecture 32 - Testing Part - III
- Lecture 33 - Testing Part - IV
- Lecture 34 - Testing Part - V
- Lecture 35 - Testing Part - VI

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Internet Technology

Subject Co-ordinator - Prof. Indranil Sengupta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction To Internet  
Lecture 2 - Review Of Network Technologies  
Lecture 3 - TCP/IP - Part-I  
Lecture 4 - TCP/IP - Part-II  
Lecture 5 - TCP/IP - Part-III  
Lecture 6 - IP Subnetting and Addressing  
Lecture 7 - Internet Routing Protocol - Part-I  
Lecture 8 - Internet Routing Protocol - Part-II  
Lecture 9 - Client Server Concepts DNS, Telnet, FTP  
Lecture 10 - Electronic Mail  
Lecture 11 - World Wide Web - Part-I  
Lecture 12 - World Wide Web - Part-II  
Lecture 13 - HTML  
Lecture 14 - HTML  
Lecture 15 - HTML  
Lecture 16 - Extensible Markup Language (XML)  
Lecture 17 - HTML Forms  
Lecture 18 - Image Maps  
Lecture 19 - CGI Scripts  
Lecture 20 - Other Technologies  
Lecture 21 - PERL - Part-I  
Lecture 22 - PERL - Part II  
Lecture 23 - PERL - Part III  
Lecture 24 - PERL - Part IV  
Lecture 25 - Javascript  
Lecture 26 - Javascript Examples (Continued)  
Lecture 27 - Using Cookies  
Lecture 28 - Java Applets  
Lecture 29 - Java Applets

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Client-Server Programming In Java
- Lecture 31 - Intranet, Extranet, Firewall
- Lecture 32 - Basic Cryptographic Concepts Part - I
- Lecture 33 - Basic Cryptographic Concepts Part - II
- Lecture 34 - Basic Cryptographic Concepts Part - III
- Lecture 35 - Electronic Commerce
- Lecture 36 - Streaming Multimedia Applications
- Lecture 37 - Internet Telephony
- Lecture 38 - Search Engine And Web Crawlers
- Lecture 39 - Search Engine And Web Crawlers
- Lecture 40 - Course Summary And Conclusion

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Programming and Data Structure

Subject Co-ordinator - Dr. P.P. Chakraborty

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - C Programming - I  
Lecture 3 - C Programming - II  
Lecture 4 - C Programming - III  
Lecture 5 - Data Structuring  
Lecture 6 - Data Structuring  
Lecture 7 - Data Structuring  
Lecture 8 - Problem Decomposition By Recursion - I  
Lecture 9 - Problem Decomposition By Recursion - II  
Lecture 10 - Problem Decomposition By Recursion - III  
Lecture 11 - Merge sort And Quick sort  
Lecture 12 - Characters And Strings  
Lecture 13 - Arrays  
Lecture 14 - Structures - I  
Lecture 15 - Structures - II  
Lecture 16 - Dynamic Allocation Part - I  
Lecture 17 - Linked Lists - I  
Lecture 18 - Complexity (Efficiency) of Algorithms  
Lecture 19 - Asymptotic Growth Functions  
Lecture 20 - Asymptotic Analysis of Algorithms  
Lecture 21 - Data Structuring  
Lecture 22 - Search Trees  
Lecture 23 - Search Trees - II  
Lecture 24 - Search Trees - III  
Lecture 25 - 2-3 Trees  
Lecture 26 - Algorithm Design - I  
Lecture 27 - Algorithm Design - II  
Lecture 28 - Algorithm Design - III  
Lecture 29 - Graphs - I

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 30 - Graphs - II  
Lecture 31 - Graphs - III  
Lecture 32 - Conclusions

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Software Testing

Subject Co-ordinator - Prof. Rajib Mall

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Levels of Testing
- Lecture 3 - Basic Concepts in Testing
- Lecture 4 - Basic Concepts in Testing (Continued...)
- Lecture 5 - Unit Testing
- Lecture 6 - Equivalence and BV Testing
- Lecture 7 - Special Value Testing
- Lecture 8 - Combinatorial Testing
- Lecture 9 - Pairwise Testing
- Lecture 10 - White Box Testing
- Lecture 11 - MC/DC Testing
- Lecture 12 - MC/DC Testing (Continued...)
- Lecture 13 - Path Testing
- Lecture 14 - Dataflow and Mutation Testing
- Lecture 15 - Mutation Testing
- Lecture 16 - Integration Testing
- Lecture 17 - System Testing
- Lecture 18 - Regression Testing
- Lecture 19 - Testing Object-Oriented Program - Part 1
- Lecture 20 - Testing Object-Oriented Program - Part 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Programming in C++

Subject Co-ordinator - Prof. Partha Pratim Das

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Module 1  
Lecture 2 - Module 1  
Lecture 3 - Module 1  
Lecture 4 - Module 2  
Lecture 5 - Module 3  
Lecture 6 - Module 4  
Lecture 7 - Module 5  
Lecture 8 - Module 6  
Lecture 9 - Module 6  
Lecture 10 - Module 7  
Lecture 11 - Module 7  
Lecture 12 - Module 8  
Lecture 13 - Module 8  
Lecture 14 - Module 8  
Lecture 15 - Module 9  
Lecture 16 - Module 9  
Lecture 17 - Module 10  
Lecture 18 - Module 10  
Lecture 19 - Module 11  
Lecture 20 - Module 11  
Lecture 21 - Module 12  
Lecture 22 - Module 12  
Lecture 23 - Module 13  
Lecture 24 - Module 13  
Lecture 25 - Module 13  
Lecture 26 - Module 14  
Lecture 27 - Module 14  
Lecture 28 - Module 14  
Lecture 29 - Module 15

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 30 - Module 15  
Lecture 31 - Module 16  
Lecture 32 - Module 17  
Lecture 33 - Module 18  
Lecture 34 - Module 19  
Lecture 35 - Module 20  
Lecture 36 - Module 21  
Lecture 37 - Module 22  
Lecture 38 - Module 23  
Lecture 39 - Module 24  
Lecture 40 - Module 25  
Lecture 41 - Module 26  
Lecture 42 - Module 27  
Lecture 43 - Module 28  
Lecture 44 - Module 29  
Lecture 45 - Module 30  
Lecture 46 - Module 31  
Lecture 47 - Module 32  
Lecture 48 - Module 33  
Lecture 49 - Module 34  
Lecture 50 - Module 35  
Lecture 51 - Module 35  
Lecture 52 - Module 36  
Lecture 53 - Module 37  
Lecture 54 - Module 38  
Lecture 55 - Module 39  
Lecture 56 - Module 40

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Machine Learning

Subject Co-ordinator - Prof. S. Sarkar

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Different Types of Learning  
Lecture 3 - Hypothesis Space and Inductive Bias  
Lecture 4 - Evaluation and Cross-Validation  
Lecture 5 - Tutorial - I  
Lecture 6 - Linear Regression  
Lecture 7 - Introduction to Decision Trees  
Lecture 8 - Learning Decision Tree  
Lecture 9 - Overfitting  
Lecture 10 - Python Exercise on Decision Tree and Linear Regression  
Lecture 11 - Tutorial - II  
Lecture 12 - k-Nearest Neighbour  
Lecture 13 - Feature Selection  
Lecture 14 - Feature Extraction  
Lecture 15 - Collaborative Filtering  
Lecture 16 - Python Exercise on kNN and PCA  
Lecture 17 - Tutorial - III  
Lecture 18 - Bayesian Learning  
Lecture 19 - Naive Bayes  
Lecture 20 - Bayesian Network  
Lecture 21 - Python Exercise on Naive Bayes  
Lecture 22 - Tutorial - IV  
Lecture 23 - Logistic Regression  
Lecture 24 - Introduction Support Vector Machine  
Lecture 25 - SVM  
Lecture 26 - SVM  
Lecture 27 - Nonlinear SVM and Kernel Function  
Lecture 28 - SVM  
Lecture 29 - Python Exercise on SVM

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Introduction
- Lecture 31 - Multilayer Neural Network
- Lecture 32 - Neural Network and Backpropagation Algorithm
- Lecture 33 - Deep Neural Network
- Lecture 34 - Python Exercise on Neural Network
- Lecture 35 - Tutorial - VI
- Lecture 36 - Introduction to Computational Learning Theory
- Lecture 37 - Sample Complexity
- Lecture 38 - VC Dimension
- Lecture 39 - Introduction to Ensembles
- Lecture 40 - Bagging and Boosting
- Lecture 41 - Introduction to Clustering
- Lecture 42 - Kmeans Clustering
- Lecture 43 - Agglomerative Hierarchical Clustering
- Lecture 44 - Python Exercise on kmeans clustering



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Object-Oriented Analysis and Design

Subject Co-ordinator - Prof. Partha Pratim Das

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Challenges in Software Engineering
- Lecture 2 - Complexity of Software
- Lecture 3 - Complexity of Software (Continued...)
- Lecture 4 - Structure and Attributes of a Complex System
- Lecture 5 - Structure and Attributes of a Complex System (Continued...)
- Lecture 6 - Object-Oriented Analysis and Design
- Lecture 7 - Bringing Order to Chaos
- Lecture 8 - Bringing Order to Chaos (Continued...)
- Lecture 9 - Evolution of Object Models - Programming Languages and Paradigms
- Lecture 10 - Foundations of the Object Model - OOA, OOD and OOP
- Lecture 11 - Foundations of the Object Model - OOA, OOD and OOP (Continued...)
- Lecture 12 - Elements of Object Model (Major)
- Lecture 13 - Elements of Object Model (Major)
- Lecture 14 - Elements of the Object Model (Major)
- Lecture 15 - Elements of the Object Model (Major)
- Lecture 16 - Elements of the Object Model (Minor)
- Lecture 17 - Elements of the Object Model (Minor)
- Lecture 18 - Nature of an object
- Lecture 19 - Nature of an object
- Lecture 20 - Relationships among objects
- Lecture 21 - Relationships among objects (Continued...)
- Lecture 22 - Nature of a class
- Lecture 23 - Nature of a class
- Lecture 24 - Relationships among classes
- Lecture 25 - Relationships among classes (Continued...)
- Lecture 26 - How to Build Quality Classes and Objects
- Lecture 27 - Tutorial
- Lecture 28 - How to Identify Classes and Objects ?
- Lecture 29 - Identification of Classes, Objects and Relationship in LMS

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- Lecture 30 - Identification of Classes, Objects and Relationship in LMS (Continued...)
- Lecture 31 - Identification of Classes, Objects and Relationship in LMS (Continued...)
- Lecture 32 - Identification of Classes, Objects and Relationship in LMS (Continued...)
- Lecture 33 - Overview of UML
- Lecture 34 - SDLC Phases and UML Diagrams
- Lecture 35 - Use-Case Diagrams - Part I
- Lecture 36 - Use-Case Diagrams - Part II
- Lecture 37 - Use-Case Diagrams - Part III
- Lecture 38 - Class Diagrams - Part 1 (Class, Property and Operation)
- Lecture 39 - Class Diagrams - Part 2 (Association, Weak and Strong Aggregation)
- Lecture 40 - Class Diagrams - Part 3 (Generalization, Dependency and Constraints)
- Lecture 41 - Sequence Diagrams - Part 1
- Lecture 42 - Sequence Diagrams - Part 2
- Lecture 43 - Communication Diagram
- Lecture 44 - Activity Diagrams - Part II
- Lecture 45 - Activity Diagrams - Part II
- Lecture 46 - Activity Diagrams - Part III
- Lecture 47 - Interaction Overview Diagram
- Lecture 48 - State Machine Diagrams - Part I
- Lecture 49 - State Machine Diagrams - Part II
- Lecture 50 - State Machine Diagrams - Part III
- Lecture 51 - Various UML Diagrams
- Lecture 52 - Closing Comments

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Complex Network : Theory and Application

Subject Co-ordinator - Prof. Animesh Mukherjee

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Network Analysis - I  
Lecture 3 - Network Analysis - II  
Lecture 4 - Network Analysis - III  
Lecture 5 - Network Analysis - IV  
Lecture 6 - Network Analysis - V  
Lecture 7 - Network Analysis - VI  
Lecture 8 - Social Network Principles - I  
Lecture 9 - Social Network Principles - II  
Lecture 10 - Social Network Principles - III  
Lecture 11 - Social Network Principles - IV  
Lecture 12 - Community Analysis - I  
Lecture 13 - Community Analysis - II  
Lecture 14 - Community Analysis - III  
Lecture 15 - Community Analysis - IV  
Lecture 16 - Community Analysis - V  
Lecture 17 - Community Analysis - VI  
Lecture 18 - Citation Analysis - I  
Lecture 19 - Citation Analysis - II  
Lecture 20 - Citation Analysis - III  
Lecture 21 - Citation Analysis - IV

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Fundamental Algorithms: Design and Analysis

Subject Co-ordinator - Prof.Sourav Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Insertion Sort and Asymptotic Analysis

Lecture 2 - Solving Recurrences

Lecture 3 - Divide and Conquer Paradigm

Lecture 4 - Quick Sort

Lecture 5 - Heap Sort

Lecture 6 - Decision Tree

Lecture 7 - Linear Time Sorting

Lecture 8 - Order Statistics

Lecture 9 - Hashing

Lecture 10 - Universal Hashing, BST Sort

Lecture 11 - Red-Black Tree

Lecture 12 - Augmenting Data Structure

Lecture 13 - Computational Geometry

Lecture 14 - Van Emde Boas Data Structure

Lecture 15 - Dynamic Programming

Lecture 16 - Graph Algorithm

Lecture 17 - BFS and DFS

Lecture 18 - Dijkstra

Lecture 19 - Bellman Ford

Lecture 20 - Floyd Marshall

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Natural Language Processing

Subject Co-ordinator - Prof. Pawan Goyal

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to the Course
- Lecture 2 - What Do We Do in NLP
- Lecture 3 - Why is NLP hard
- Lecture 4 - Empirical Laws
- Lecture 5 - Text Processing
- Lecture 6 - Spelling Correction
- Lecture 7 - Weighted Edit Distance, Other Variations
- Lecture 8 - Noisy Channel Model for Spelling Correction
- Lecture 9 - N-Gram Language Models
- Lecture 10 - Evaluation of Language Models, Basic Smoothing
- Lecture 11 - Tutorial I
- Lecture 12 - Language Modeling
- Lecture 13 - Computational Morphology
- Lecture 14 - Finite - State Methods for Morphology
- Lecture 15 - Introduction to POS Tagging
- Lecture 16 - Hidden Markov Models for POS Tagging
- Lecture 17 - Viterbi Decoding for HMM, Parameter Learning
- Lecture 18 - Baum Welch Algorithm
- Lecture 19 - Maximum Entropy Models - I
- Lecture 20 - Maximum Entropy Models - II
- Lecture 21 - Conditional Random Fields
- Lecture 22 - Syntax - Introduction
- Lecture 23 - Syntax - Parsing I
- Lecture 24 - Syntax - CKY, PCFGs
- Lecture 25 - PCFGs - Inside-Outside Probabilities
- Lecture 26 - Inside-Outside Probabilities
- Lecture 27 - Dependency Grammars and Parsing - Introduction
- Lecture 28 - Transition Based Parsing
- Lecture 29 - Transition Based Parsing

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - MST-Based Dependency Parsing
- Lecture 31 - MST-Based Dependency Parsing
- Lecture 32 - Distributional Semantics - Introduction
- Lecture 33 - Distributional Models of Semantics
- Lecture 34 - Distributional Semantics
- Lecture 35 - Word Embeddings - Part I
- Lecture 36 - Word Embeddings - Part II
- Lecture 37 - Lexical Semantics
- Lecture 38 - Lexical Semantics - Wordnet
- Lecture 39 - Word Sense Disambiguation - I
- Lecture 40 - Word Sense Disambiguation - II
- Lecture 41 - Novel Word Sense detection
- Lecture 42 - Topic Models
- Lecture 43 - Latent Dirichlet Allocation
- Lecture 44 - Gibbs Sampling for LDA, Applications
- Lecture 45 - LDA Variants and Applications - I
- Lecture 46 - LDA Variants and Applications - II
- Lecture 47 - Entity Linking - I
- Lecture 48 - Entity Linking - II
- Lecture 49 - Information Extraction - Introduction
- Lecture 50 - Relation Extraction
- Lecture 51 - Distant Supervision
- Lecture 52 - Text Summarization - LEXRANK
- Lecture 53 - Optimization based Approaches for Summarization
- Lecture 54 - Summarization Evaluation
- Lecture 55 - Text Classification - I
- Lecture 56 - Text Classification - II
- Lecture 57 - Tutorial II
- Lecture 58 - Tutorial III
- Lecture 59 - Tutorial IV
- Lecture 60 - Tutorial V
- Lecture 61 - Sentiment Analysis - Introduction
- Lecture 62 - Sentiment Analysis - Affective Lexicons
- Lecture 63 - Learning Affective Lexicons
- Lecture 64 - Computing with Affective Lexicons
- Lecture 65 - Aspect - Based Sentiment Analysis

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Embedded Systems Design

Subject Co-ordinator - Prof. Anupam Basu

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Processors  
Lecture 3 - General Purpose and ASIPs Processor  
Lecture 4 - Designing a Single Purpose Processor  
Lecture 5 - Optimization Issues  
Lecture 6 - Introduction to FPPFA  
Lecture 7 - FPGA (Continued...)  
Lecture 8 - Behaviour Synthesis on FPGA using VHDL  
Lecture 9 - Tutorial - I  
Lecture 10 - Tutorial - II  
Lecture 11 - Tutorial - III  
Lecture 12 - Tutorial - IV  
Lecture 13 - Sensors and Signals  
Lecture 14 - Discretization of Signals and A/D Converter  
Lecture 15 - Quantization Noise, SNR and D/A Converter  
Lecture 16 - Arduino Uno  
Lecture 17 - Arduino Uno (Continued...), Serial Communication and Timer  
Lecture 18 - Controller Design using Arduino  
Lecture 19 - Tutorial - V  
Lecture 20 - Power Aware Embedded System - I  
Lecture 21 - Power Aware Embedded System - II  
Lecture 22 - SD and DD Algorithm  
Lecture 23 - Parallel Operations and VLIW  
Lecture 24 - Code Efficiency  
Lecture 25 - DSP Application and Address Generation Unit  
Lecture 26 - Real Time O.S - I  
Lecture 27 - Real Time O.S - II  
Lecture 28 - RMS Algorithm  
Lecture 29 - EDF Algorithm and Resource Constraint Issue

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Priority Inversion and Priority Inheritance Protocol
- Lecture 31 - Modeling and Specification - I
- Lecture 32 - Modeling and Specification - II
- Lecture 33 - FSM and Statechart
- Lecture 34 - Statechart and State Machine Semantics
- Lecture 35 - Statecharts (Continued...)
- Lecture 36 - Program State Machines
- Lecture 37 - SDL
- Lecture 38 - Data Flow Model - I
- Lecture 39 - Data Flow Model - II
- Lecture 40 - Hardware Synthesis - I
- Lecture 41 - Hardware Synthesis - II
- Lecture 42 - Scheduling
- Lecture 43 - Digital Camera Design
- Lecture 44 - Digital Camera - Iterative Design
- Lecture 45 - HW-SW Partitioning
- Lecture 46 - Optimization - I
- Lecture 47 - Optimization - II
- Lecture 48 - Simulation
- Lecture 49 - Formal Verification



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Wireless Ad Hoc and Sensor Networks

Subject Co-ordinator - Prof. Sudip Misra

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Introduction  
Lecture 3 - Self-organizing Behaviour of Wireless Ad Hoc Networks  
Lecture 4 - Cooperation in Mobile Ad Hoc Networks - Part-I  
Lecture 5 - Cooperation in Mobile Ad Hoc Networks - Part-II  
Lecture 6 - MAC Protocols in MANETs - Part-I  
Lecture 7 - MAC Protocols in MANETs - Part-II  
Lecture 8 - Routing in MANETs - Part-I  
Lecture 9 - Routing in MANETs - Part-II  
Lecture 10 - Routing in MANETs - Part-III  
Lecture 11 - Multicasting in MANETs  
Lecture 12 - Mobility Models for MANETs  
Lecture 13 - Transport Protocols for MANETs - Part-I  
Lecture 14 - Transport Protocols for MANETs - Part-II  
Lecture 15 - Opportunistic Mobile Networks - Part-I  
Lecture 16 - Opportunistic Mobile Networks - Part-II  
Lecture 17 - Opportunistic Mobile Networks - Part-III  
Lecture 18 - UAV Networks - Part-I  
Lecture 19 - UAV Networks - Part-II  
Lecture 20 - UAV Networks - Part-III  
Lecture 21 - Introduction  
Lecture 22 - Introduction  
Lecture 23 - WSN Coverage and Placement - Part-I  
Lecture 24 - Topology Mangement in Wireless Sensor Network  
Lecture 25 - Mobile Wireless Sensor Networks  
Lecture 26 - Mobile Wireless Sensor Networks  
Lecture 27 - Medium Access Control in Wireless Networks - Part-I  
Lecture 28 - Medium Access Control in Wireless Networks - Part-II  
Lecture 29 - Routing in Wireless Sensor Networks - Part-I

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Routing in Wireless Sensor Networks - Part-II
- Lecture 31 - Congestion and Flow Control - Part-I
- Lecture 32 - Congestion and Flow Control - Part-II
- Lecture 33 - Underwater Sensor Networks - Part-I
- Lecture 34 - Underwater Sensor Networks - Part-II
- Lecture 35 - Underwater Sensor Networks - Part-III
- Lecture 36 - Underwater Sensor Networks - Part-IV
- Lecture 37 - Security of Wireless Sensor Networks - Part-I
- Lecture 38 - Security of Wireless Sensor Networks - Part-II
- Lecture 39 - Hardware Design of Sensor Node
- Lecture 40 - Real Life Deployment of WSN

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:VLSI Physical Design

Subject Co-ordinator - Prof. Indranil Sengupta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Design Representation  
Lecture 3 - VLSI Design Styles - Part 1  
Lecture 4 - VLSI Design Styles - Part 2  
Lecture 5 - VLSI Physical Design Automation - Part 1  
Lecture 6 - VLSI Physical Design Automation - Part 2  
Lecture 7 - Partitioning  
Lecture 8 - Floor planning  
Lecture 9 - Floor planning Algorithms  
Lecture 10 - Pin Assignment  
Lecture 11 - Placement - Part 1  
Lecture 12 - Placement - Part 2  
Lecture 13 - Placement - Part 3  
Lecture 14 - Placement - Part 4  
Lecture 15 - Grid Routing - Part 1  
Lecture 16 - Grid Routing - Part 2  
Lecture 17 - Grid Routing - Part 3  
Lecture 18 - Global Routing - Part 1  
Lecture 19 - Global Routing - Part 2  
Lecture 20 - Detailed Routing - Part 1  
Lecture 21 - Detailed Routing - Part 2  
Lecture 22 - Detailed Routing - Part 3  
Lecture 23 - Detailed Routing - Part 4  
Lecture 24 - Clock Design - Part 1  
Lecture 25 - Clock Design - Part 2  
Lecture 26 - Clock Design - Part 3  
Lecture 27 - Clock Network Synthesis - Part 1  
Lecture 28 - Clock Network Synthesis - Part 2  
Lecture 29 - Clock Network Synthesis - Part 3

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## NPTTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Clock Network Synthesis - Part 4
- Lecture 31 - Power and Ground Routing
- Lecture 32 - Time Closure - Part 1
- Lecture 33 - Time Closure - Part 2
- Lecture 34 - Time Closure - Part 3
- Lecture 35 - Time Closure - Part 4
- Lecture 36 - Time Closure - Part 5
- Lecture 37 - Timing Driven Placement
- Lecture 38 - Timing Driven Routing
- Lecture 39 - Physical Synthesis - Part 1
- Lecture 40 - Physical Synthesis - Part 2
- Lecture 41 - Performance-Driven Design Flow
- Lecture 42 - Miscellaneous Approaches to Timing Optimization
- Lecture 43 - Interconnect Modeling - Part 1
- Lecture 44 - Interconnect Modeling - Part 2
- Lecture 45 - Design Rule Check
- Lecture 46 - Layout Compaction - Part 1
- Lecture 47 - Layout Compaction - Part 2
- Lecture 48
- Lecture 49
- Lecture 50
- Lecture 51
- Lecture 52
- Lecture 53 - Test Pattern Generation
- Lecture 54 - Design for Testability
- Lecture 55 - Boundary Scan Standard
- Lecture 56 - Built-in Self-Test - Part 1
- Lecture 57 - Built-in Self-Test - Part 2
- Lecture 58 - Low Power VLSI Design
- Lecture 59 - Techniques to Reduce Power
- Lecture 60 - Gate Level Design for Low Power - Part 1
- Lecture 61 - Gate Level Design for Low Power - Part 2
- Lecture 62 - Other Low Power Design Techniques
- Lecture 63 - Algorithmic Level Techniques for Low Power Design
- Lecture 64 - Summarization of the Course

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Cryptography And Network Security

Subject Co-ordinator - Prof. Sourav Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Cryptography
- Lecture 2 - Classical Cryptosystem
- Lecture 3 - Cryptanalysis on Substitution Cipher (Frequency Analysis)
- Lecture 4 - Play Fair Cipher
- Lecture 5 - Block Cipher
- Lecture 6 - Data Encryption Standard (DES)
- Lecture 7 - DES (Continued...)
- Lecture 8 - Triple DES and Modes of Operation
- Lecture 9 - Stream Cipher
- Lecture 10 - Pseudorandom Sequence
- Lecture 11 - LFSR Based StreamCipher
- Lecture 12 - Mathematical Background
- Lecture 13 - Abstract Algebra (Continued...)
- Lecture 14 - Number Theory
- Lecture 15 - Number Theory (Continued...)
- Lecture 16 - Modular Inverse
- Lecture 17 - Extended Euclidean Algorithm
- Lecture 18 - Fermat's Little Theorem, Euler Phi-Function
- Lecture 19 - Euler's theorem, Quadratic Residue
- Lecture 20 - Polynomial Arithmetic
- Lecture 21 - Advanced Encryption Standard (AES)
- Lecture 22 - Advanced Encryption Standard (AES) (Continued...)
- Lecture 23 - Introduction to Public Key Cryptosystem, Diffie-Hellman Key Exchange
- Lecture 24 - Knapsack Cryptosystem
- Lecture 25 - RSA Cryptosystem
- Lecture 26 - More on RSA
- Lecture 27 - Primarily Testing
- Lecture 28 - ElGamal Cryptosystem
- Lecture 29 - Elliptic Curve over the Reals

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- Lecture 30 - Elliptic curve Modulo a Prime
- Lecture 31 - Generalised ElGamal Public Key Cryptosystem
- Lecture 32 - Chinese Remainder Theorem
- Lecture 33 - Rabin Cryptosystem
- Lecture 34 - Legendre and Jacobi Symbol
- Lecture 35 - Jacobi Symbol (Continued...)
- Lecture 36 - Message Authentication
- Lecture 37 - Digital Signature
- Lecture 38 - Key Management
- Lecture 39 - Key Exchange
- Lecture 40 - Hash Function
- Lecture 41 - Universal Hashing
- Lecture 42 - Cryptographic Hash Function
- Lecture 43 - Secure Hash Algorithm (SHA)
- Lecture 44 - Digital Signature Standard (DSS)
- Lecture 45 - More on Key Exchange Protocol
- Lecture 46 - Cryptoanalysis
- Lecture 47 - Memory Trade off Attack
- Lecture 48 - Differential Cryptoanalysis
- Lecture 49 - More on Differential Cryptoanalysis
- Lecture 50 - Linear Cryptoanalysis
- Lecture 51 - Cryptoanalysis and Stream Cipher
- Lecture 52 - Modern Stream Cipher
- Lecture 53 - Shamir Secret Sharing
- Lecture 54 - Identity Based Encryption (IBE)
- Lecture 55 - Attribute Based Encryption
- Lecture 56 - Functional Encryption (Introduction)
- Lecture 57 - Discrete Logarithm Problem (DLP)
- Lecture 58 - Implementation Attacks
- Lecture 59 - The Secure Sockets layer (SSL)
- Lecture 60 - Pretty Good Privacy (PGP)

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computer Architecture and Organization

Subject Co-ordinator - Prof. Indranil Sengupta, Prof. Kamalika Datta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Evolution of Computer Systems
- Lecture 2 - Basic Operation of a Computer
- Lecture 3 - Memory Addressing and Languages
- Lecture 4 - Software and Architecture Types
- Lecture 5 - Instruction Set Architecture
- Lecture 6 - Number Representation
- Lecture 7 - Instruction Format and Addressing Modes
- Lecture 8 - CISC and RISC Architecture
- Lecture 9 - MIPS32 Instruction Set
- Lecture 10 - MIPS Programming Examples
- Lecture 11 - Spim - A Mips32 Simulator
- Lecture 12 - Measuring Cpu Performance
- Lecture 13 - Choice Of Benchmarks
- Lecture 14 - Summarizing Performance Results
- Lecture 15 - Amadahl's Law - Part 1
- Lecture 16 - Amadahl's Law - Part 2
- Lecture 17 - Design Of Control Unit - Part 1
- Lecture 18 - Design Of Control Unit - Part 2
- Lecture 19 - Design Of Control Unit - Part 3
- Lecture 20 - Design Of Control Unit - Part 4
- Lecture 21 - Mips Implementation - Part 1
- Lecture 22 - Mips Implementation - Part 2
- Lecture 23 - Processor Memory Interaction
- Lecture 24 - Static And Dynamic Ram
- Lecture 25 - Asynchronous Dram
- Lecture 26 - Synchronous Dram
- Lecture 27 - Memory Interfacing And Addressing
- Lecture 28 - Memory Hierarchy Design - Part 1
- Lecture 29 - Memory Hierarchy Design - Part 2

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- Lecture 30 - Cache Memory - Part 1
- Lecture 31 - Cache Memory - Part 2
- Lecture 32 - Improving Cache Performance
- Lecture 33 - Design Of Adders - Part 1
- Lecture 34 - Design Of Adders - Part 2
- Lecture 35 - Design Of Multipliers - Part 1
- Lecture 36 - Design Of Multipliers - Part 2
- Lecture 37 - Design Of Dividers
- Lecture 38 - Floating-Point Numbers
- Lecture 39 - Floating-Point Arithmetic
- Lecture 40 - Basic Pipelining Concepts
- Lecture 41 - Pipeline Scheduling
- Lecture 42 - Arithmetic Pipeline
- Lecture 43 - Secondary Storage Devices
- Lecture 44 - Input-Output Organization
- Lecture 45 - Data Transfer Techniques
- Lecture 46 - Interrupt Handling - Part 1
- Lecture 47 - Interrupt Handling - Part 2
- Lecture 48 - Direct Memory Access
- Lecture 49 - Some Example Device Interfacing
- Lecture 50 - Exercises On I/O Transfer
- Lecture 51 - Bus Standards
- Lecture 52 - Bus Standards
- Lecture 53 - Pipelining The Mips32 Data Path
- Lecture 54 - Mips Pipeline (Continued...)
- Lecture 55 - Pipeline Hazards - Part 1
- Lecture 56 - Pipeline Hazards - Part 2
- Lecture 57 - Pipeline Hazards - Part 3
- Lecture 58 - Pipeline Hazards - Part 4
- Lecture 59 - Multicycle Operations In Mips32
- Lecture 60 - Exploiting Instruction Level Parallelism
- Lecture 61 - Vector Processors
- Lecture 62 - Multi-Core Processors
- Lecture 63 - Some Case Studies
- Lecture 64 - Summarization Of The Course



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Algorithms and Analysis

Subject Co-ordinator - Prof. Sourav Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Insertion sort  
Lecture 2 - Analysis of Insertion Sort  
Lecture 3 - Asymptotic Analysis  
Lecture 4 - Recurrence of Merge Sort  
Lecture 5 - Substitution Method  
Lecture 6 - The Master Method  
Lecture 7 - Divide-and-Conquer  
Lecture 8 - Divide-and-Conquer (Continued...)  
Lecture 9 - Straseen's Algorithms  
Lecture 10 - QuickSort  
Lecture 11 - Analysis of Quicksort  
Lecture 12 - Randomized Quicksort  
Lecture 13 - Heap  
Lecture 14 - Heap Sort  
Lecture 15 - Decision Tree  
Lecture 16 - Linear time Sorting  
Lecture 17 - Radix Sort and Bucket Sort  
Lecture 18 - Order Statistics  
Lecture 19 - Randomised Order Statistics  
Lecture 20 - Worst case linear time order statistics  
Lecture 21 - Hash Function  
Lecture 22 - Open Addressing  
Lecture 23 - Universal Hashing  
Lecture 24 - Perfect Hashing  
Lecture 25 - Binary Search Tree (BST) Sort  
Lecture 26 - Randomly build BST  
Lecture 27 - Red Black Tree  
Lecture 28 - Red Black Tree (Continued...)  
Lecture 29 - Augmentation of data structure

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Interval trees
- Lecture 31 - Fixed universe successor
- Lecture 32 - Van Emde Boas data structure
- Lecture 33 - Amortized analysis
- Lecture 34 - Computational Geometry
- Lecture 35 - Computational Geometry (Continued...)
- Lecture 36 - Dynamic Programming
- Lecture 37 - Longest common subsequence
- Lecture 38 - Graphs
- Lecture 39 - Prim's Algorithms
- Lecture 40 - Graph Search
- Lecture 41
- Lecture 42
- Lecture 43
- Lecture 44
- Lecture 45
- Lecture 46
- Lecture 47
- Lecture 48
- Lecture 49
- Lecture 50
- Lecture 51
- Lecture 52 - Union-Find
- Lecture 53 - Augmented disjoint set data structure
- Lecture 54 - Network flow
- Lecture 55 - Network Flow (Continued...)

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Hardware Modeling using Verilog

Subject Co-ordinator - Prof. Indranil Sengupta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1  
Lecture 2  
Lecture 3  
Lecture 4  
Lecture 5  
Lecture 6 - Verilog Language Features - Part 1  
Lecture 7 - Verilog Language Features - Part 2  
Lecture 8 - Verilog Language Features - Part 3  
Lecture 9 - Verilog Operators  
Lecture 10 - Verilog Modeling Examples  
Lecture 11 - Verilog Modeling Examples (Continued...)  
Lecture 12 - Verilog Description Styles  
Lecture 13 - Procedural Assignment  
Lecture 14 - Procedural Assignment (Continued...)  
Lecture 15 - Procedural Assignment (Examples)  
Lecture 16 - Blocking / Non-Blocking Assignments - Part 1  
Lecture 17 - Blocking / Non-Blocking Assignments - Part 2  
Lecture 18 - Blocking / Non-Blocking Assignments - Part 3  
Lecture 19 - Blocking / Non-Blocking Assignments - Part 4  
Lecture 20 - User Defined Primitives  
Lecture 21 - Verilog Test Bench  
Lecture 22 - Writing Verilog Test Benches  
Lecture 23 - Modeling Finite State Machines  
Lecture 24 - Modeling Finite State Machines (Continued...)  
Lecture 25 - Datapath And Controller Design - Part 1  
Lecture 26 - Datapath And Controller Design - Part 2  
Lecture 27 - Datapath And Controller Design - Part 3  
Lecture 28 - Synthesizable Verilog  
Lecture 29 - Some Recommended Practices

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Modeling Memory
- Lecture 31 - Modeling Register Banks
- Lecture 32 - Basic Pipelining Concepts
- Lecture 33 - Pipeline Modeling - Part 1
- Lecture 34 - Pipeline Modeling - Part 2
- Lecture 35 - Switch Level Modeling - Part 1
- Lecture 36 - Switch Level Modeling - Part 2
- Lecture 37 - Pipeline Implementation Of A Processor - Part 1
- Lecture 38 - Pipeline Implementation Of A Processor - Part 2
- Lecture 39 - Pipeline Implementation Of A Processor - Part 3
- Lecture 40 - Verilog Modeling Of The Processor - Part 1
- Lecture 41 - Verilog Modeling Of The Processor - Part 2

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Internet of Things

Subject Co-ordinator - Prof. Sudip Misra

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to IoT- Part I

Lecture 2 - Introduction to IoT- Part II

Lecture 3 - Sensing

Lecture 4 - Actuation

Lecture 5 - Basics of IoT Networking - Part I

Lecture 6 - Basics of IoT Networking - Part II

Lecture 7 - Basics of IoT Networking - Part III

Lecture 8 - Basics of IoT Networking - Part IV

Lecture 9 - Connectivity Technologies - Part I

Lecture 10 - Connectivity Technologies - Part II

Lecture 11

Lecture 12

Lecture 13

Lecture 14

Lecture 15

Lecture 16

Lecture 17

Lecture 18

Lecture 19

Lecture 20

Lecture 21

Lecture 22

Lecture 23

Lecture 24

Lecture 25

Lecture 26 - Introduction to Python Programming - I

Lecture 27 - Introduction to Python Programming - II

Lecture 28 - Introduction to Raspberry Pi - I

Lecture 29 - Introduction to Raspberry Pi - II

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Implementation of IoT with Raspberry Pi - I
- Lecture 31
- Lecture 32
- Lecture 33
- Lecture 34
- Lecture 35
- Lecture 36 - Software Defined IoT Networking - II
- Lecture 37 - Cloud Computing-Fundamental
- Lecture 38 - Cloud Computing-Service Model
- Lecture 39 - Cloud Computing-Service Management and Security
- Lecture 40 - Cloud Computing - Case Studies
- Lecture 41 - Cloud Computing - Practical
- Lecture 42 - Sensor-Cloud - I
- Lecture 43 - Sensor-Cloud - II
- Lecture 44 - Fog Computing - I
- Lecture 45 - Fog Computing - II
- Lecture 46 - Smart Cities and Smart Homes - I
- Lecture 47 - Smart Cities and Smart Homes - II
- Lecture 48 - Smart Cities and Smart Homes - III
- Lecture 49 - Connected Vehicles - I
- Lecture 50 - Connected Vehicles - II
- Lecture 51 - Smart Grid - I
- Lecture 52 - Smart Grid - II
- Lecture 53 - Industrial Internet of Things - I
- Lecture 54 - Industrial Internet of Things - II
- Lecture 55 - Data Handling and Analytics - I
- Lecture 56 - Data Handling and Analytics - II
- Lecture 57 - Case Study
- Lecture 58 - Case Study
- Lecture 59 - Case Study
- Lecture 60 - Case Study

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Cloud Computing

Subject Co-ordinator - Prof. Soumya Kanti Ghosh

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Cloud Computing Overview
- Lecture 2 - Cloud Computing Overview (Continued...)
- Lecture 3 - Cloud Computing - Introduction
- Lecture 4 - Cloud Computing Architecture
- Lecture 5 - Cloud Computing Architecture (Continued...)
- Lecture 6 - Cloud Computing Architecture - Deployment Models
- Lecture 7 - Cloud Computing Virtualization
- Lecture 8 - Cloud Computing XML Basics
- Lecture 9 - Cloud Computing XML Basics - II
- Lecture 10 - Cloud Computing Web Services, Service Oriented Architecture
- Lecture 11 - Service Level Agreement
- Lecture 12 - Cloud Economics
- Lecture 13 - Managing Data
- Lecture 14 - Introduction to MapReduce
- Lecture 15 - Open Stack
- Lecture 16 - Cloud Computing - Opensource Cloud - Openstack Demo
- Lecture 17 - Cloud Computing Case Study with a commercial Cloud - Microsoft Azure
- Lecture 18 - Cloud Computing Demo - Microsoft Azure
- Lecture 19 - Cloud Computing Case Study - Google Cloud Platform (GCP)
- Lecture 20 - Cloud Computing Demo - Google Cloud Platform (GCP)
- Lecture 21 - SLA-Tutorial
- Lecture 22 - Cloudeconomics-Tutorial
- Lecture 23 - MapReduce-Tutorial
- Lecture 24 - Resource Management - I
- Lecture 25 - Resource Management - II
- Lecture 26 - Cloud Computing: Security - I
- Lecture 27 - Cloud Computing: Security - II
- Lecture 28 - Cloud Computing: Security - III
- Lecture 29 - Cloud Computing: Security Issues in Collaborative SaaS Cloud

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Cloud Computing: Broker for Cloud Marketplace
- Lecture 31 - Mobile Cloud Computing - I
- Lecture 32 - Mobile Cloud Computing - II
- Lecture 33 - Fog Computing - I
- Lecture 34 - Fog Computing - II
- Lecture 35 - Use Case-Geo-spatial Cloud
- Lecture 36 - Introduction to DOCKER Container
- Lecture 37 - Green Cloud
- Lecture 38 - Sensor Cloud Computing
- Lecture 39 - IoT Cloud
- Lecture 40 - Course Summary and Research Areas
- Lecture 41 - Cloud-Fog Computing - Overview
- Lecture 42 - Resource Management - I
- Lecture 43 - Resource Management - II
- Lecture 44 - Cloud Federation
- Lecture 45 - VM Migration - Basics Migration strategies
- Lecture 46 - VM Migration - Basics Migration strategies
- Lecture 47 - Containers Container based Virtualization Kubernetes Docker Container
- Lecture 48 - Docker Container - Overview Docker - Components Docker - Architecture
- Lecture 49 - Docker Container - Demo
- Lecture 50 - Docker Container - Demo
- Lecture 51 - Dew Computing
- Lecture 52 - Serverless Computing - I
- Lecture 53 - Serverless Computing - II
- Lecture 54 - Sustainable Cloud Computing - I
- Lecture 55 - Sustainable Cloud Computing - II
- Lecture 56 - Cloud Computing in 5G Era
- Lecture 57 - CPS and Cloud Computing
- Lecture 58 - Case Study I (Spatial Cloud Computing)
- Lecture 59 - Case Study II (Internet of Health Things) - Part A
- Lecture 60 - Case Study II (Internet of Health Things) - Part B



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Problem Solving through Programming in C

Subject Co-ordinator - Prof.Arnab sarkar, Prof.Jatindra Kumar Deka, Dr. Santosh Biswas

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Idea of Algorithms
- Lecture 3 - Flow Chart and Pseudocode
- Lecture 4 - Introduction to Programming Language Concepts
- Lecture 5 - Variables and Memory
- Lecture 6 - Types of Software and Compilers
- Lecture 7 - Introduction to C Programming Language
- Lecture 8 - Variables and Variable Types in C
- Lecture 9 - Introducing Functions
- Lecture 10 - Address and Content of Variables and Types
- Lecture 11 - Assignment Statement and Operators in C
- Lecture 12 - Arithmetic Expressions and Relational Expressions
- Lecture 13 - Logical Operators and Change in Control Flow
- Lecture 14 - Use of Logical Operatoers in Branching
- Lecture 15 - Branching
- Lecture 16 - IF-ELSE Statement (Continued...)
- Lecture 17 - Switch statement
- Lecture 18 - Switch Statement (Continued...) and Introduction to Loops
- Lecture 19 - Implementing Repetitions (Loops)
- Lecture 20 - Implementation of Loops with for Statement (Continued...)
- Lecture 21 - For Statement (Continued...)
- Lecture 22 - Example of If-Else
- Lecture 23 - Example of Loops
- Lecture 24 - Example of Loops (Continued...)
- Lecture 25 - Example of Loops (Continued...), Use of FOR Loops
- Lecture 26 - Introduction to Arrays
- Lecture 27 - Arrays (Continued...)
- Lecture 28 - Arrays (Continued...)
- Lecture 29 - Program using Arrays

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Array Problem
- Lecture 31 - Linear Search
- Lecture 32 - Character Array and Strings
- Lecture 33 - String Operations
- Lecture 34 - 2-D Array Operation
- Lecture 35 - Introducing Functions
- Lecture 36 - More on Functions
- Lecture 37 - Function (Continued...)
- Lecture 38 - Scanf and Printf Functions; Function Prototype
- Lecture 39 - Parameter Passing in Function Revision
- Lecture 40 - Parameter Passing in Function Revision (Continued...)
- Lecture 41 - Substitution of # include and Macro
- Lecture 42 - search as a function
- Lecture 43 - Binary Search
- Lecture 44 - Binary Search (Continued...)
- Lecture 45 - Sorting Methods
- Lecture 46 - Bubble Sort (Continued...)
- Lecture 47 - Use of Pointer in Function
- Lecture 48 - Arrays at Strings
- Lecture 49 - Data Representation
- Lecture 50 - Bisection Method
- Lecture 51 - Interpolation
- Lecture 52 - Trapezoidal Rule and Runge-Kutta Method
- Lecture 53 - Recursion
- Lecture 54 - Recursion (Continued...)
- Lecture 55 - Structure
- Lecture 56 - Structure (Continued...)
- Lecture 57 - Structure with typedef
- Lecture 58 - Pointer
- Lecture 59 - Pointer (Continued...)
- Lecture 60 - Pointer in Structures
- Lecture 61 - Dynamic Allocation and File

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Real Time Operating System

Subject Co-ordinator - Prof. Rajib Mall

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Basics of Task scheduling
- Lecture 3 - Cyclic executives
- Lecture 4 - Cyclic Scheduler
- Lecture 5 - Cyclic Scheduler
- Lecture 6 - Exercises on Frame size Selection
- Lecture 7 - Event-driven schedulers
- Lecture 8 - Rate Monotonic Algorithm
- Lecture 9 - RMA Task Schedulability
- Lecture 10 - Rate Monotonic Analysis
- Lecture 11 - RMA Generalizations
- Lecture 12 - Further RMA Generalizations
- Lecture 13 - Resource Sharing among Real-Time Tasks
- Lecture 14 - Solution to Priority Inversion Problem
- Lecture 15 - Highest Locker Protocol
- Lecture 16 - Priority Ceiling Protocol
- Lecture 17 - PCP Priority Inversions
- Lecture 18 - Analysis of PCP priority inversions
- Lecture 19 - Some basic issues in Real-Time Operating Systems
- Lecture 20 - Unix as a Real-Time operating System

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Soft Computing

Subject Co-ordinator - Prof. Debasis Samanta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to soft computing
- Lecture 2 - Introduction to Fuzzy Logic
- Lecture 3 - Fuzzy membership functions (Continued...) and Defining Membership functions
- Lecture 4 - Fuzzy operations
- Lecture 5 - Fuzzy relations
- Lecture 6 - Fuzzy Relations (Continued...) and Fuzzy propositions
- Lecture 7 - Fuzzy implications
- Lecture 8 - Fuzzy Inferences
- Lecture 9 - Defuzzification techniques (Part-I)
- Lecture 10 - Defuzzification Techniques (Part-I) (Continued...)
- Lecture 11 - Fuzzy logic controller
- Lecture 12 - Fuzzy Logic Controller (Continued...)
- Lecture 13 - Fuzzy logic controller (Continued...)
- Lecture 14 - Concept of Genetic Algorithm
- Lecture 15 - Concept of Genetic Algorithm (Continued...) and GA Strategies
- Lecture 16 - GA Operator
- Lecture 17 - GA operator
- Lecture 18 - GA Operator
- Lecture 19 - GA Operator
- Lecture 20 - GA Operator
- Lecture 21 - GA Operator
- Lecture 22 - GA Operator
- Lecture 23 - GA Operator
- Lecture 24 - Multi-objective optimization problem solving
- Lecture 25 - Multi-objective optimization problem solving (Continued...)
- Lecture 26 - Concept of domination
- Lecture 27 - Non-Pareto based approaches to solve MOOPs
- Lecture 28 - Non-Pareto based approaches to solve MOOPs (Continued...)
- Lecture 29 - Pareto-Based approaches to solve MOOPs

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Pareto-based approaches to solve MOOPs (Continued....)
- Lecture 31 - Pareto-based approach to solve MOOPs
- Lecture 32 - Pareto-based approach to solve MOOPs (Continued...)
- Lecture 33 - Pareto-based approach to solve MOOPs (Continued...)
- Lecture 34 - Introduction to Artificial Neural Network
- Lecture 35 - ANN Architectures
- Lecture 36 - Training ANNs
- Lecture 37 - Training ANNs (Continued....)
- Lecture 38 - Training ANNs (Continued....)
- Lecture 39 - Training ANNs (Continued....)
- Lecture 40 - Soft computing tools

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Data Mining

Subject Co-ordinator - Prof. Pabitra Mitra

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction, Knowledge Discovery Process

Lecture 2 - Data Preprocessing - I

Lecture 3 - Data Preprocessing - II

Lecture 4 - Association Rules

Lecture 5 - Apriori algorithm

Lecture 6 - Rule generation

Lecture 7 - Classification

Lecture 8 - Decision Tree - I

Lecture 9 - Decision Tree - II

Lecture 10 - Decision Tree - III

Lecture 11 - Decision Tree - IV

Lecture 12 - Bayes Classifier - I

Lecture 13 - Bayes Classifier - II

Lecture 14 - Bayes Classifier - III

Lecture 15 - Bayes Classifier - IV

Lecture 16 - Bayes Classifier - V

Lecture 17 - K Nearest Neighbor - I

Lecture 18 - K Nearest Neighbor - II

Lecture 19

Lecture 20

Lecture 21

Lecture 22 - Support Vector Machine - I

Lecture 23 - Support Vector Machine - II

Lecture 24 - Support Vector Machine - III

Lecture 25 - Support Vector Machine - IV

Lecture 26 - Support Vector Machine - V

Lecture 27 - Kernel Machines

Lecture 28 - Artificial Neural Networks - I

Lecture 29 - Artificial Neural Networks - II

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Artificial Neural Networks - III
- Lecture 31 - Artificial Neural Networks - IV
- Lecture 32 - Clustering - I
- Lecture 33 - Clustering - II
- Lecture 34 - Clustering - III
- Lecture 35 - Clustering - IV
- Lecture 36 - Clustering - V
- Lecture 37 - Regression - I
- Lecture 38 - Regression - II
- Lecture 39 - Regression - III
- Lecture 40 - Regression - IV
- Lecture 41 - Dimensionality Reduction - I
- Lecture 42 - Dimensionality Reduction - II
- Lecture 43 - Tutorial
- Lecture 44 - Live Session

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Data Base Management System

Subject Co-ordinator - Prof. Partha Pratim Das

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Course Overview  
Lecture 2 - Introduction to DBMS/1  
Lecture 3 - Introduction to DBMS/2  
Lecture 4 - Introduction to Relational Model/1  
Lecture 5 - Introduction to Relational Model/2  
Lecture 6 - Introduction to SQL/1  
Lecture 7 - Introduction to SQL/2  
Lecture 8 - Introduction to SQL/3  
Lecture 9 - Intermediate SQL/1  
Lecture 10 - Intermediate SQL/2  
Lecture 11 - Advanced SQL  
Lecture 12 - Formal Relational Query Languages  
Lecture 13 - Entity-Relationship Model/1  
Lecture 14 - Entity-Relationship Model/2  
Lecture 15 - Entity-Relationship Model/3  
Lecture 16 - Relational Database Design  
Lecture 17 - Relational Database Design (Continued...)  
Lecture 18 - Relational Database Design/3  
Lecture 19 - Relational Database Design (Continued...)  
Lecture 20 - Relational Database Design/5  
Lecture 21 - Application Design and Development/1  
Lecture 22 - Application Design and Development/2  
Lecture 23 - Application Design and Development/3  
Lecture 24 - Storage and File Structure/1  
Lecture 25 - Storage and File Structure/2  
Lecture 26 - Indexing and Hashing/1  
Lecture 27 - Indexing and Hashing/2  
Lecture 28 - Indexing and Hashing/3  
Lecture 29 - Indexing and Hashing/4

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Indexing and Hashing/5
- Lecture 31 - Transactions/1
- Lecture 32 - Transactions/2
- Lecture 33 - Transactions/3
- Lecture 34 - Concurrency Control/1
- Lecture 35 - Concurrency Control/2
- Lecture 36 - Recovery/1
- Lecture 37 - Recovery/2
- Lecture 38 - Query Processing and Optimization/1
- Lecture 39 - Query Processing and Optimization/2
- Lecture 40 - Course Summarization
- Lecture 41 - Live Session
- Lecture 42 - Live Session - 2

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Software Engineering

Subject Co-ordinator - Prof. Rajib Mall

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction - I
- Lecture 2 - Introduction - II
- Lecture 3 - Introduction - III
- Lecture 4 - Introduction - IV
- Lecture 5 - Introduction - V
- Lecture 6 - Life Cycle Model
- Lecture 7 - Life Cycle Model
- Lecture 8 - Waterfall Model
- Lecture 9 - Waterfall Derivatives
- Lecture 10 - Incremental Model
- Lecture 11 - Evolutionary Model
- Lecture 12 - Agile Model
- Lecture 13 - Extreme Programming and Scrum
- Lecture 14 - Scrum
- Lecture 15 - Introduction to requirement specification
- Lecture 16 - Requirement gathering and analysis
- Lecture 17 - Functional requirements
- Lecture 18 - Representation of complex programming logic
- Lecture 19 - Design Fundamentals
- Lecture 20 - Modular Design
- Lecture 21 - Classification of Cohesion
- Lecture 22 - Classification of Coupling
- Lecture 23 - Introduction to structured analysis and structured design
- Lecture 24 - Basics of Data Flow Diagrams (DFD)
- Lecture 25 - Developing DFD Model
- Lecture 26 - Examples of DFD Model development
- Lecture 27 - DFD Model - More Examples
- Lecture 28 - Essentials of Structure Chart
- Lecture 29 - Transform Analysis, Transaction Analysis

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Structured Design Examples
- Lecture 31 - Use Case Modelling
- Lecture 32 - Factoring Use Cases
- Lecture 33 - Overview of Class diagram
- Lecture 34 - Inheritance relationship
- Lecture 35 - Association relationship
- Lecture 36 - Aggregation/ Composition and dependency relations
- Lecture 37 - Interation Modelling
- Lecture 38 - Development of Sequence diagrams
- Lecture 39 - State-Machram diagram
- Lecture 40 - An Object-Oriented design process
- Lecture 41 - Domain Analysis
- Lecture 42 - Examples of object-oriented design
- Lecture 43 - Basic concepts in Testing - I
- Lecture 44 - Basic concepts in Testing - II
- Lecture 45 - Basic concepts in Testing - III
- Lecture 46 - Unit testing strategies - I
- Lecture 47 - Unit testing strategies - II
- Lecture 48 - Equivalence Class Testing - I
- Lecture 49 - Equivalence Class Testing - II
- Lecture 50 - Special Value Testing
- Lecture 51 - Combinatorial Testing
- Lecture 52 - Decision Table Testing
- Lecture 53 - Cause effect graphing
- Lecture 54 - Pairwise Testing
- Lecture 55 - White box Testing
- Lecture 56 - Condition Testing
- Lecture 57 - MC/DC Coverage
- Lecture 58 - MC/DC Testing
- Lecture 59 - Path Testing
- Lecture 60 - Dataflow and Mutation Testing

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computer Networks and Internet Protocol

Subject Co-ordinator - Prof. Sandip Chakraborty, Prof. Soumya Kanti Ghosh

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Computer Networks - A brief history
- Lecture 2 - Data Networks - from Circuit Switching Network to Packet Switching Network
- Lecture 3 - Network Protocol Stack
- Lecture 4 - Services at the Different Layers of the Protocol Stack
- Lecture 5 - Application Layer I - Different Protocols at the Application Layer
- Lecture 6 - Application Layer II - Domain Name Systems
- Lecture 7 - Application Layer III - The Web
- Lecture 8 - Application Layer III - Hypertext Transfer Protocol
- Lecture 9 - Application Layer III - Internet Mail Transfer
- Lecture 10 - Application Layer IV - File Transfer (FTP)
- Lecture 11 - Transport Layer I - Services
- Lecture 12 - Transport Layer II - Connection
- Lecture 13 - Transport Layer II - Connection (Continued...)
- Lecture 14 - Transport Layer IV - Reliability
- Lecture 15 - Transport Layer V - Sliding Window Protocols
- Lecture 16 - Transport Layer Performance
- Lecture 17 - Buffer Management and Congestion Control
- Lecture 18 - Transport Layer Primitives
- Lecture 19 - Transmission Control Protocol I - Basics
- Lecture 20 - Transmission Control Protocol II - Connections
- Lecture 21 - Transmission Control Protocol III - Flow Control
- Lecture 22 - Transmission Control Protocol IV - Congestion Control
- Lecture 23 - User Datagram Protocol
- Lecture 24 - Socket Programming - I
- Lecture 25 - Socket Programming - II
- Lecture 26 - Network Layer I - Introduction
- Lecture 27 - IP Addressing (IPv4) I - Classful addressing
- Lecture 28 - IP Addressing (IPv4) II - CIDR
- Lecture 29 - IP Addressing (IPv4) III - Network Address Translation (NAT)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - IPv6 Addressing
- Lecture 31 - Internet QoS - I (What is QoS)
- Lecture 32 - Internet QoS - II (Basic QoS Architecture)
- Lecture 33 - Internet QoS - III (Traffic Policing and Traffic Shaping)
- Lecture 34 - Internet QoS - IV (Traffic Scheduling)
- Lecture 35 - Internet QoS - V (Integrated and Differentiated Service Architecture)
- Lecture 36 - IP Routing Table
- Lecture 37 - Routing in the Internet I - Intra-domain routing
- Lecture 38 - Routing in the Internet II - Routing protocols
- Lecture 39 - Routing in the Internet III - Inter-domain Routing
- Lecture 40 - Routing in the Internet IV - Border Gateway Protocol
- Lecture 41 - IP Routers
- Lecture 42 - IP Routers Demo
- Lecture 43 - Software Defined Networking - I (Basics)
- Lecture 44 - Software Defined Networking - II (Open Flow)
- Lecture 45 - Software Defined Networking - III (Demo)
- Lecture 46 - Data Link Layer - Overview
- Lecture 47 - Data Link Layer - Basic Concepts
- Lecture 48 - Data Link Layer - Ethernet
- Lecture 49 - Data Link Layer - Ethernet (Continued...)
- Lecture 50 - Data Link Layer - Flow and Error Control
- Lecture 51 - ARP-RAPP-BOOTP-DHCP
- Lecture 52 - ARP-RAPP-BOOTP-DHCP (Continued...)
- Lecture 53
- Lecture 54 - Wireless LANs
- Lecture 55 - Layer 1
- Lecture 56 - Layer 1
- Lecture 57 - Layer 1
- Lecture 58 - Network Security - Overview
- Lecture 59 - Network Security - II
- Lecture 60 - Network Security - III [TCP/IP Security]

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Blockchain Architecture Design and Use Cases

Subject Co-ordinator - Praveen Jayachandran, Prof. Sandip Chakraborty

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Blockchain - I (Basics)
- Lecture 2 - Introduction to Blockchain - II (History)
- Lecture 3 - Introduction to Blockchain - III (Architecture)
- Lecture 4 - Introduction to Blockchain - IV (Conceptualization)
- Lecture 5 - Basic Crypto Primitives - I
- Lecture 6 - Basic Crypto Primitives - II
- Lecture 7 - Bitcoin Basics - I
- Lecture 8 - Bitcoin Basics - II
- Lecture 9 - Bitcoin Basics - III
- Lecture 10 - Distributed Consensus
- Lecture 11 - Consensus in Bitcoin - I (The Basics)
- Lecture 12 - Consensus in Bitcoin - II (PoW and Beyond)
- Lecture 13 - Consensus in Bitcoin - III (The Miners)
- Lecture 14 - Permissioned Blockchain - I (Basics)
- Lecture 15 - Permissioned Blockchain - II (Consensus)
- Lecture 16 - Permissioned Blockchain - III (RAFT Consensus)
- Lecture 17 - Permissioned Blockchain - IV (Byzantine General Problem)
- Lecture 18 - Permissioned Blockchain - V (Practical Byzantine Fault Tolerance)
- Lecture 19 - Blockchain for Enterprise - Overview
- Lecture 20 - Blockchain Components and Concepts
- Lecture 21 - Hyperledger Fabric - Transaction Flow
- Lecture 22 - Hyperledger Fabric Details
- Lecture 23 - Fabric - Membership and Identity Management
- Lecture 24 - Hyperledger Fabric Network Setup
- Lecture 25 - Fabric Demo on IBM Blockchain Cloud - I
- Lecture 26 - Fabric Demo on IBM Blockchain Cloud - II
- Lecture 27 - Fabric Demo, deploy from scratch - III
- Lecture 28 - Hyperledger Composer - Application Development
- Lecture 29 - Hyperledger Composer - Network Administration

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Blockchain Use Cases
- Lecture 31 - Blockchain in Financial Service - I (Payments and Secure Trading)
- Lecture 32 - Blockchain in Financial Service - II (Compliance and Mortgage)
- Lecture 33 - Blockchain in Financial Service - III (Financial Trade)
- Lecture 34 - Revolutionizing Global Trade
- Lecture 35 - Blockchain in Supply Chain - I
- Lecture 36 - Blockchain in Supply Chain - II
- Lecture 37 - Blockchain in Other Industries
- Lecture 38 - Blockchain in Government - I (Advantages)
- Lecture 39 - Blockchain in Government - II (Use Cases)
- Lecture 40 - Blockchain in Government - III (Digital Identity)
- Lecture 41 - Blockchain in Government - IV (Hyperledger Indy)
- Lecture 42 - Blockchain in Government - V (Tax Payments and Land Registry Records)
- Lecture 43 - Blockchain Security - I (Overview)
- Lecture 44 - Blockchain Security - II (Membership and Access control in Fabric)
- Lecture 45 - Blockchain Security - III (Privacy in Fabric)
- Lecture 46 - Blockchain Security - III (Fabric SideDB)
- Lecture 47 - Research Aspects - I (Consensus Scalability)
- Lecture 48 - Research Aspects - II (Bitcoin-NG)
- Lecture 49 - Research Aspects - III (Collective Signing)
- Lecture 50 - Research Aspects - IV (Byzcoin)
- Lecture 51 - Research Aspects - V (Algorand)
- Lecture 52 - Research Aspects - VI (Cross Fault Tolerance)
- Lecture 53 - Research Aspects - VII (Secured Multi-Party Computation)
- Lecture 54 - Blockchain for Science - I (Blockchain for Big Data)
- Lecture 55 - Blockchain for Science - II (Blockchain and AI)
- Lecture 56 - Comparing Ecosystems - Ethereum
- Lecture 57 - Comparing Ecosystems - Ethereum development tools and Quorum
- Lecture 58 - Comparing Ecosystems - Corda Part 1
- Lecture 59 - Comparing Ecosystems - Corda Part 2
- Lecture 60 - Concluding the course

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Switching Circuits and Logic Design

Subject Co-ordinator - Prof. Indranil Sengupta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Octal and Hexadecimal Number Systems
- Lecture 3 - Signed and Unsigned Binary Number Representation
- Lecture 4 - Binary Addition and Subtraction
- Lecture 5 - BCD and Gray Code Representations
- Lecture 6 - Error Detection and Correction
- Lecture 7 - Logic Gates
- Lecture 8 - Logic Families to Implement Gates
- Lecture 9 - Emerging Technologies - Part I
- Lecture 10 - Emerging Technologies - Part II
- Lecture 11 - Switching Algebra
- Lecture 12 - Algebraic Manipulation
- Lecture 13 - Properties of Switching Functions
- Lecture 14 - Obtaining Canonical Representations of Functions
- Lecture 15 - Functional Completeness
- Lecture 16 - Minimization Using Karnaugh Maps - Part I
- Lecture 17 - Minimization Using Karnaugh Maps - Part II
- Lecture 18 - Minimization Using Karnaugh Maps - Part III
- Lecture 19 - Minimization using Tabular Method - Part I
- Lecture 20 - Minimization using Tabular Method - Part II
- Lecture 21 - Design of Adders - Part I
- Lecture 22 - Design of Adders - Part II
- Lecture 23 - Design of Adders - Part III
- Lecture 24 - Logic Design - Part I
- Lecture 25 - Logic Design - Part II
- Lecture 26 - Logic Design - Part III
- Lecture 27 - Binary Decision Diagrams - Part I
- Lecture 28 - Binary Decision Diagrams - Part II
- Lecture 29 - Logic Design using AND-EXOR Network

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- Lecture 30 - Threshold Logic and Threshold Gates
- Lecture 31 - Latches and Flip-Flops - Part I
- Lecture 32 - Latches and Flip-Flops - Part II
- Lecture 33 - Latches and Flip-Flops - Part III
- Lecture 34 - Clocking and Timing - Part I
- Lecture 35 - Clocking and Timing - Part II
- Lecture 36 - Synthesis of Synchronous Sequential Circuits - Part I
- Lecture 37 - Synthesis of Synchronous Sequential Circuits - Part II
- Lecture 38 - Synthesis of Synchronous Sequential Circuits - Part III
- Lecture 39 - Synthesis of Synchronous Sequential Circuits - Part IV
- Lecture 40 - Minimization of Finite State Machines - Part I
- Lecture 41 - Minimization of Finite State Machines - Part II
- Lecture 42 - Design of Registers - Part I
- Lecture 43 - Design of Registers - Part II
- Lecture 44 - Design of Registers - Part III
- Lecture 45 - Design of Counters - Part I
- Lecture 46 - Design of Counters - Part II
- Lecture 47 - Digital-to-Analog Converter - Part I
- Lecture 48 - Digital-to-Analog Converter - Part II
- Lecture 49 - Analog-to-Digital Converter - Part I
- Lecture 50 - Analog-to-Digital Converter - Part II
- Lecture 51 - Analog-to-Digital Converter - Part III
- Lecture 52 - Asynchronous Sequential Circuits - Part I
- Lecture 53 - Asynchronous Sequential Circuits - Part II
- Lecture 54 - Algorithmic State Machine (ASM Chart
- Lecture 55 - Testing of Digital Circuits
- Lecture 56 - Fault Modeling
- Lecture 57 - Test Pattern Generation
- Lecture 58 - Design for Testability
- Lecture 59 - Built-in Self-Test - Part I
- Lecture 60 - Built-in Self-Test - Part II

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Scalable Data Science

Subject Co-ordinator - Prof. Sourangshu Bhattacharya, Prof. Anirban Dasgupta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Background
- Lecture 2 - Probability
- Lecture 3 - Linear algebra
- Lecture 4 - Optimization
- Lecture 5 - Machine Learning
- Lecture 6 - Memory-efficient data structures
- Lecture 7 - Bloom filters
- Lecture 8 - Sketches for distinct count
- Lecture 9 - Sketches for distinct count (Continued...)
- Lecture 10 - Misra-Gries sketch
- Lecture 11 - Frequent Element
- Lecture 12 - Frequent Element
- Lecture 13 - Near Neighbors
- Lecture 14 - Locality Sensitive Hashing
- Lecture 15 - Building LSH Tables
- Lecture 16 - Approximate near neighbors search
- Lecture 17 - Approximate near neighbors search
- Lecture 18 - Approximate near neighbors search
- Lecture 19 - Randomized Numerical Linear Algebra
- Lecture 20 - Randomized Numerical Linear Algebra
- Lecture 21 - Randomized Numerical Linear Algebra
- Lecture 22 - Randomized Numerical Linear Algebra
- Lecture 23 - Randomized Numerical Linear Algebra
- Lecture 24 - Randomized Numerical Linear Algebra
- Lecture 25 - Randomized Numerical Linear Algebra
- Lecture 26 - Map-reduce and Hadoop
- Lecture 27 - Hadoop System
- Lecture 28 - Hadoop System (Continued...)
- Lecture 29 - Hadoop System (Continued...)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Spark
- Lecture 31 - Spark (Continued...)
- Lecture 32 - Spark (Continued...)
- Lecture 33 - Distributed Machine Learning and Optimization
- Lecture 34 - SGD+Proof
- Lecture 35 - SGD+Proof (Continued...)
- Lecture 36 - Distributed Machine Learning and Optimization
- Lecture 37 - Distributed Machine Learning and Optimization
- Lecture 38 - Clustering
- Lecture 39 - Clustering (Continued...)
- Lecture 40 - Conclusion

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Compiler Design

Subject Co-ordinator - Prof. Santanu Chattopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Introduction (Continued...)  
Lecture 3 - Introduction (Continued...)  
Lecture 4 - Introduction (Continued...)  
Lecture 5 - Introduction (Continued...)  
Lecture 6 - Introduction (Continued...)  
Lecture 7 - Lexical Analysis  
Lecture 8 - Lexical Analysis (Continued...)  
Lecture 9 - Lexical Analysis (Continued...)  
Lecture 10 - Lexical Analysis (Continued...)  
Lecture 11 - Lexical Analysis (Continued...)  
Lecture 12 - Lexical Analysis (Continued...)  
Lecture 13 - Lexical Analysis (Continued...)  
Lecture 14 - Lexical Analysis (Continued...)  
Lecture 15 - Lexical Analysis (Continued...)  
Lecture 16 - Parser  
Lecture 17 - Parser (Continued...)  
Lecture 18 - Parser (Continued...)  
Lecture 19 - Parser (Continued...)  
Lecture 20 - Parser (Continued...)  
Lecture 21 - Parser (Continued...)  
Lecture 22 - Parser (Continued...)  
Lecture 23 - Parser (Continued...)  
Lecture 24 - Parser (Continued...)  
Lecture 25 - Parser (Continued...)  
Lecture 26 - Parser (Continued...)  
Lecture 27 - Parser (Continued...)  
Lecture 28 - Parser (Continued...)  
Lecture 29 - Parser (Continued...)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Parser (Continued...)
- Lecture 31 - Parser (Continued...)
- Lecture 32 - SR Latch and Introduction to Clocked Flip-Flop
- Lecture 33 - Edge-Triggered Flip-Flop
- Lecture 34 - Representations of Flip-Flops
- Lecture 35 - Analysis of Sequential Logic Circuit
- Lecture 36 - Conversion of Flip-Flops and Flip-Flop Timing Parameters
- Lecture 37 - Register and Shift Register
- Lecture 38 - Shift Register
- Lecture 39 - Application of Shift Register
- Lecture 40 - Linear Feedback Shift Register
- Lecture 41 - Serial Addition, Multiplication and Division
- Lecture 42 - Type Checking (Continued...)
- Lecture 43 - Symbol Table
- Lecture 44 - Symbol Table (Continued...)
- Lecture 45 - Symbol Table (Continued...)
- Lecture 46 - Symbol Table (Continued...) and Runtime Environment
- Lecture 47 - Runtime Environment
- Lecture 48 - Runtime Environment (Continued...)
- Lecture 49 - Runtime Environment (Continued...)
- Lecture 50 - Intermediate Code Generation
- Lecture 51 - Intermediate Code Generation (Continued...)
- Lecture 52 - Intermediate Code Generation (Continued...)
- Lecture 53 - Intermediate Code Generation (Continued...)
- Lecture 54 - Intermediate Code Generation (Continued...)
- Lecture 55 - Intermediate Code Generation (Continued...)
- Lecture 56 - Intermediate Code Generation (Continued...)
- Lecture 57 - Intermediate Code Generation (Continued...)
- Lecture 58 - Intermediate Code Generation (Continued...)
- Lecture 59 - Intermediate Code Generation (Continued...)
- Lecture 60 - Intermediate Code Generation (Continued...)
- Lecture 61 - Intermediate Code Generation (Continued...)

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Programming in Java

Subject Co-ordinator - Prof. Debasis Samanta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Java Programming Steps  
Lecture 3 - Java Tools and Resources  
Lecture 4 - Demonstration - I  
Lecture 5 - Java Applet Programming  
Lecture 6 - Demonstration - II  
Lecture 7 - Encapsulation  
Lecture 8 - Demonstration - III  
Lecture 9 - Java Programming Insights  
Lecture 10 - Demonstration - IV  
Lecture 11 - Java Static Scope Rule  
Lecture 12 - Demonstration - V  
Lecture 13 - Inheritance  
Lecture 14 - Demonstration - VI  
Lecture 15 - Information Hiding  
Lecture 16 - Demonstration - VII  
Lecture 17 - Packages - I  
Lecture 18 - Packages - II  
Lecture 19 - Demonstration - VIII  
Lecture 20 - Interface - I  
Lecture 21 - Interface - II  
Lecture 22 - Demonstration - IX  
Lecture 23 - Exception Handling - I  
Lecture 24 - Exception Handling - II  
Lecture 25 - Exception Handling - III  
Lecture 26 - Demonstration - X  
Lecture 27 - Multithreading - I  
Lecture 28 - Multithreading - II  
Lecture 29 - Demonstration - XI

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - I-O Stream - I
- Lecture 31 - I-O Stream - II
- Lecture 32 - I-O Stream - III
- Lecture 33 - Demonstration - XII
- Lecture 34 - Applet Programming - I
- Lecture 35 - Applet Programming - II
- Lecture 36 - Applet Programming - III
- Lecture 37 - Demonstration - XIII
- Lecture 38 - Demonstration - XIV
- Lecture 39 - AWT Programming - I
- Lecture 40 - AWT Programming - II
- Lecture 41 - Demonstration - XV
- Lecture 42 - AWT Programming - III
- Lecture 43 - Swing - I
- Lecture 44 - Swing - II
- Lecture 45 - Demonstration - XVI
- Lecture 46 - Demonstration - XVII
- Lecture 47 - Demonstration - XVIII
- Lecture 48 - Networking with Java
- Lecture 49 - Demonstration - XIX
- Lecture 50 - JDBC - I
- Lecture 51 - JDBC - II
- Lecture 52 - JDBC - III
- Lecture 53 - Demonstration - XX
- Lecture 54 - Demonstration - XXI
- Lecture 55 - Demonstration - XXII
- Lecture 56 - Case Studies - I
- Lecture 57 - Case Studies - II
- Lecture 58 - Case Studies - III
- Lecture 59 - Case Studies - IV
- Lecture 60 - Case Studies - V

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Discrete Structures

Subject Co-ordinator - Prof. Dipanwita Roychowdhury

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Propositional Logic  
Lecture 2 - Introduction to Propositional Logic (Continued...)  
Lecture 3 - Introduction to Propositional Logic (Continued...)  
Lecture 4 - Introduction to Propositional Logic (Continued...)  
Lecture 5 - Introduction to Propositional Logic (Continued...)  
Lecture 6 - Introduction to Propositional Logic (Continued...)  
Lecture 7 - Predicate Logic  
Lecture 8 - Predicate Logic (Continued...)  
Lecture 9 - Predicate Logic (Continued...)  
Lecture 10 - Predicate Logic (Continued...)  
Lecture 11 - Proof Techniques  
Lecture 12 - Proof Techniques (Continued...)  
Lecture 13 - Proof Techniques (Continued...)  
Lecture 14 - Proof Techniques (Continued...)  
Lecture 15 - Proof Techniques (Continued...)  
Lecture 16 - Sets and Functions  
Lecture 17 - Sets and Functions (Continued...)  
Lecture 18 - Sets and Functions (Continued...)  
Lecture 19 - Sets and Functions (Continued...)  
Lecture 20 - Sets and Functions (Continued...)  
Lecture 21 - Relations and their Properties  
Lecture 22 - Relations and their Properties (Continued...)  
Lecture 23 - Relations and their Properties (Continued...)  
Lecture 24 - Relations and their Properties (Continued...)  
Lecture 25 - Relations and their Properties (Continued...)  
Lecture 26 - Recursion  
Lecture 27 - Recursion (Continued...)  
Lecture 28 - Recursion (Continued...)  
Lecture 29 - Recursion (Continued...)

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- Lecture 30 - Recursion (Continued...)
- Lecture 31 - Recurrence relations
- Lecture 32 - Recurrence relations (Continued...)
- Lecture 33 - Recurrence relations (Continued...)
- Lecture 34 - Recurrence relations (Continued...)
- Lecture 35 - Recurrence relations (Continued...)
- Lecture 36 - Counting Techniques and Pigeonhole Principle
- Lecture 37 - Counting Techniques and Pigeonhole Principle (Continued...)
- Lecture 38 - Counting Techniques and Pigeonhole Principle (Continued...)
- Lecture 39 - Counting Techniques and Pigeonhole Principle (Continued...)
- Lecture 40 - Counting Techniques and Pigeonhole Principle (Continued...)
- Lecture 41 - Combinatorics
- Lecture 42 - Combinatorics (Continued...)
- Lecture 43 - Combinatorics (Continued...)
- Lecture 44 - Combinatorics (Continued...)
- Lecture 45 - Combinatorics (Continued...)
- Lecture 46 - Algebraic Structures
- Lecture 47 - Algebraic Structures (Continued...)
- Lecture 48 - Algebraic Structures (Continued...)
- Lecture 49 - Algebraic Structures (Continued...)
- Lecture 50 - Algebraic Structures (Continued...)
- Lecture 51 - Ring and Modular Arithmetic
- Lecture 52 - Ring and Modular Arithmetic (Continued...)
- Lecture 53 - Ring and Modular Arithmetic (Continued...)
- Lecture 54 - Ring and Modular Arithmetic (Continued...)
- Lecture 55 - Ring and Modular Arithmetic (Continued...)
- Lecture 56 - Finite Field and Applications
- Lecture 57 - Finite Field and Applications (Continued...)
- Lecture 58 - Finite Field and Applications (Continued...)
- Lecture 59 - Finite Field and Applications (Continued...)
- Lecture 60 - Finite Field and Applications (Continued...)

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Embedded System Design with ARM

Subject Co-ordinator - Prof. Indranil Sengupta, Prof. Kamalika Datta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction To Embedded Systems
- Lecture 2 - Design Considerations of Embedded Systems
- Lecture 3 - Microprocessors and Microcontrollers
- Lecture 4 - Architecture of ARM Microcontroller - Part 1
- Lecture 5 - Architecture of ARM Microcontroller - Part 2
- Lecture 6 - Architecture of ARM Microcontroller - Part 3
- Lecture 7 - ARM Instruction Set - Part 1
- Lecture 8 - ARM Instruction Set - Part 2
- Lecture 9 - ARM Instruction Set - Part 3
- Lecture 10 - About the STM32F401 Nucleo Board
- Lecture 11 - PWM and Interrupt on STM32F401
- Lecture 12 - Digital to Analog Conversion
- Lecture 13 - Analog to Digital Conversion - Part 1
- Lecture 14 - Analog to Digital Conversion - Part 2
- Lecture 15 - Output Devices, Sensors and Actuators - Part 1
- Lecture 16 - Output Devices, Sensors and Actuators - Part 2
- Lecture 17 - Output Devices, Sensors and Actuators - Part 3
- Lecture 18 - Microcontroller Development Boards
- Lecture 19 - Mbed C Programming Environment
- Lecture 20 - Interfacing With STM32F401 Board
- Lecture 21 - Interfacing With Arduino Uno
- Lecture 22 - Interfacing 7-Segment Led And LCD Displays - Part 1
- Lecture 23 - Interfacing 7-segment LED and LCD Displays - Part 2
- Lecture 24 - Serial Port Terminal Application (Coolterm)
- Lecture 25 - Experiment With Temperature Sensor
- Lecture 26 - Experiment With Ldr Light Sensor - Part 1
- Lecture 27 - Experiment With Ldr Light Sensor - Part 2
- Lecture 28 - Experiment With Speaker
- Lecture 29 - Experiment With Microphone

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Design Of Control System
- Lecture 31 - Experiments With Relay
- Lecture 32 - Experiments On Speed Control Of Dc Motor
- Lecture 33 - Experiment With Multiple Sensors And Relay
- Lecture 34 - Introduction To Internet Of Things
- Lecture 35 - Gsm And Bluetooth
- Lecture 36 - Design Of A Home Automation System
- Lecture 37 - Design Of A Simple Alarm System Using Touch Sensor
- Lecture 38 - Accelerometer
- Lecture 39 - Experiment Using Accelerometer
- Lecture 40 - Experiment Using Bluetooth
- Lecture 41 - Experiment With Gas Sensor
- Lecture 42 - Summarization Of The Course

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Hardware Security

Subject Co-ordinator - Dr. Debdeep Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Hardware Security - Part 1
- Lecture 2 - Introduction to Hardware Security - Part 2
- Lecture 3 - Algorithm to Hardware
- Lecture 4 - Finite Field Architectures - 1
- Lecture 5 - Finite Field Architectures - 1 (Continued...)
- Lecture 6 - Hardware Design for Finite Field Inverse
- Lecture 7 - Hardware Architecture for Finite Field Inverse
- Lecture 8 - Background on Cryptography, Cryptanalysis and Advanced Encryption Standard (AES)
- Lecture 9 - Advanced Encryption Standard (AES) and Side Channel Analysis
- Lecture 10 - Field Isomorphisms
- Lecture 11 - Field Isomorphisms (Continued...)
- Lecture 12 - Hardware Implementation of Advanced Encryption
- Lecture 13 - Hardware Implementation of Advanced Encryption
- Lecture 14 - Hardware Implementation of Advanced Encryption (Continued...)
- Lecture 15 - Compact AES-Box
- Lecture 16 - Compact AES S-Box - Part II
- Lecture 17 - Compact AES S-Box in Normal Basis - Part I
- Lecture 18 - Compact AES S-Box in Normal Basis - Part II
- Lecture 19 - Hardware for Elliptic Curve Cryptography - Part I
- Lecture 20 - Hardware for Elliptic Curve Cryptography - Part II
- Lecture 21 - Hardware for Elliptic Curve Cryptography - Part III
- Lecture 22 - Hardware for Elliptic Curve Cryptography - Part IV
- Lecture 23 - Hardware for Elliptic Curve Cryptography - Part V
- Lecture 24 - Introduction to Side Channel Analysis
- Lecture 25 - Power Analysis - Part I
- Lecture 26
- Lecture 27
- Lecture 28
- Lecture 29

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30
- Lecture 31 - Power Analysis - Part VII
- Lecture 32 - Power Analysis - Part VIII
- Lecture 33 - Power Analysis - Part IX
- Lecture 34 - Power Analysis - Part X
- Lecture 35 - Power Analysis - Part XI
- Lecture 36
- Lecture 37
- Lecture 38
- Lecture 39
- Lecture 40
- Lecture 41 - Power Analysis - Part XVII
- Lecture 42 - Power Analysis - Part XVIII
- Lecture 43 - Power Analysis Countermeasures
- Lecture 44 - Power Analysis Countermeasures (Continued...)
- Lecture 45 - Power Analysis Countermeasures (Continued...)
- Lecture 46 - Fault Analysis of Cryptosystems
- Lecture 47 - Improved DFA of AES
- Lecture 48 - Multi-Byte and key Scheduling Based Fault Analysis of AES
- Lecture 49 - Multi-Byte and key Scheduling Based Fault Analysis of AES (Continued...)
- Lecture 50 - Redundancy Based Fault Intensity
- Lecture 51 - Redundancy Base Fault Countermeasures and Differential Fault Intensity Attacks (Continued...)
- Lecture 52 - Infective Countermeasures for DFA
- Lecture 53 - Infective Countermeasures for DFA (Continued...)
- Lecture 54 - Infective Countermeasures for DFA (Continued...)
- Lecture 55 - Microarchitectural attacks
- Lecture 56 - Microarchitectural attacks
- Lecture 57 - Microarchitectural attacks
- Lecture 58 - Microarchitectural attacks
- Lecture 59 - Microarchitectural attacks
- Lecture 60 - Microarchitectural attacks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Industry 4.0 and Industrial Inter

Subject Co-ordinator - Prof. Sudip Misra

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction

Lecture 2 - Introduction

Lecture 3 - Introduction

Lecture 4 - Introduction

Lecture 5 - Introduction

Lecture 6 - Industry 4.0

Lecture 7 - Industry 4.0

Lecture 8 - Industry 4.0

Lecture 9 - Industry 4.0

Lecture 10 - Industry 4.0

Lecture 11 - Industry 4.0

Lecture 12 - Industry 4.0

Lecture 13 - Industry 4.0

Lecture 14 - Industry 4.0

Lecture 15 - Industry 4.0

Lecture 16 - Industry 4.0

Lecture 17 - Basics of Industrial IoT

Lecture 18 - Basics of Industrial IoT

Lecture 19 - Basics of IIoT

Lecture 20 - Basics of Industrial IoT

Lecture 21 - Basics of Industrial IoT

Lecture 22 - Business Models and Reference Architecture for IIoT

Lecture 23 - Business Models and Reference Architecture for IIoT

Lecture 24 - Business Models and Reference Architecture for IIoT

Lecture 25 - Business Models and Reference Architecture for IIoT

Lecture 26 - Key Enablers of Industrial IoT

Lecture 27 - Key Enablers of Industrial IoT

Lecture 28 - Key Enablers of Industrial IoT

Lecture 29 - Key Enablers of Industrial IoT

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Key Enablers of Industrial IoT
- Lecture 31 - Key Enablers of Industrial IoT
- Lecture 32 - Key Enablers of Industrial IoT
- Lecture 33 - Key Enablers of Industrial IoT
- Lecture 34 - Key Enablers of Industrial IoT
- Lecture 35 - Key Enablers of Industrial IoT
- Lecture 36 - IIoT Analytics and Data Management
- Lecture 37 - IIoT Analytics and Data Management
- Lecture 38 - IIoT Analytics and Data Management
- Lecture 39 - IIoT Analytics and Data Management
- Lecture 40 - IIoT Analytics and Data Management
- Lecture 41 - Analytics and Data Management
- Lecture 42 - IIoT Analytics and Data Management
- Lecture 43 - IIoT Analytics and Data Management
- Lecture 44 - IIoT Analytics and Data Management
- Lecture 45 - Advanced Technologies
- Lecture 46 - Advanced Technologies
- Lecture 47 - Advanced Technologies
- Lecture 48 - Advanced Technologies
- Lecture 49 - IIoT Applications
- Lecture 50 - IIoT Applications
- Lecture 51 - IIoT Applications
- Lecture 52 - IIoT Applications
- Lecture 53 - IIoT Applications
- Lecture 54 - IIoT Applications
- Lecture 55 - IIoT Applications
- Lecture 56 - IIoT Applications
- Lecture 57 - IIoT Applications
- Lecture 58 - Case Studies for Industry 4.0 and IIoT
- Lecture 59 - Milk Processing and Packaging Industries
- Lecture 60 - Manufacturing Industries - Part I
- Lecture 61 - Manufacturing Industries - Part II
- Lecture 62 - Student Projects - Part I
- Lecture 63 - Student Projects - Part II
- Lecture 64 - Virtual Reality Lab
- Lecture 65 - Steel Technology Lab

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Automata, Languages and Computati

Subject Co-ordinator - Prof. Sourav Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Deterministic Finite Automata (DFA)
- Lecture 2 - Input alphabet
- Lecture 3 - Extended transition function
- Lecture 4 - Language of DFA
- Lecture 5 - Building DFA
- Lecture 6 - Building DFA (Continued...)
- Lecture 7 - NFA (Nondeterministic Finite Automata)
- Lecture 8 - Language of a NFA
- Lecture 9 - Equivalence of DFAs and NFAs
- Lecture 10 - Subset Construction
- Lecture 11 -  $\epsilon$ -NFA
- Lecture 12 - Extended transition function of NFA
- Lecture 13 - Language of NFA
- Lecture 14 - NFA to DFA
- Lecture 15 - NFA to DFA
- Lecture 16 - Regular expression
- Lecture 17 - Regular expression (Continued...)
- Lecture 18 - More on regular expression
- Lecture 19 - Equivalence of NFA and regular expression
- Lecture 20 - Equivalence of NFA and regular expression (Continued...)
- Lecture 21 - DFA to Regular expression
- Lecture 22 - DFA to Regular expression (Continued...)
- Lecture 23 - Construction of regular expression from a DFA (example)
- Lecture 24 - Closure properties of Regular Set
- Lecture 25 - Closure properties of Regular Set (Continued...)
- Lecture 26 - Substitution
- Lecture 27 - Pumping Lemma
- Lecture 28 - Application of the pumping lemma
- Lecture 29 - More on Pumping lemma

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- Lecture 30 - Ardens Theorem
- Lecture 31 - Minimization of FA
- Lecture 32 - Minimization of FA (Continued...)
- Lecture 33 - Two way FA
- Lecture 34 - Finite automata with output
- Lecture 35 - Equivalence of Moore and Mealy machine
- Lecture 36 - Context free grammars (CFG)
- Lecture 37 - Context free language (CFL)
- Lecture 38 - More example on CFL
- Lecture 39 - More on CFG
- Lecture 40 - Derivation Tree/Parse Tree
- Lecture 41 - Leftmost and Rightmost derivations
- Lecture 42 - Ambiguity in CFG
- Lecture 43 - Simplification of CFG
- Lecture 44 - Algorithms to construct reduced grammar
- Lecture 45 - Elimination of Null and Unit productions
- Lecture 46 - Chomsky Normal Form (CNF)
- Lecture 47 - Greibach Normal Form (GNF)
- Lecture 48 - Pushdown Automata (PDA)
- Lecture 49 - Language accepted by PDA
- Lecture 50 - Example of a language accepted by PDA
- Lecture 51 - Deterministic PDA
- Lecture 52 - Equivalence of language accepted
- Lecture 53 - Equivalence PDA
- Lecture 54 - Equivalence PDA and CFL
- Lecture 55 - Equivalence PDA and CFL (Continued...)
- Lecture 56 - Relationship between regular language and CFL
- Lecture 57 - Pumping lemma for CFLs
- Lecture 58 - Closer properties of CFLs
- Lecture 59 - Turning Machine
- Lecture 60 - Language accepted by a Turning machine

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Operating System Fundamentals

Subject Co-ordinator - Prof. Santanu Chattopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Introduction (Continued...)  
Lecture 3 - Introduction (Continued...)  
Lecture 4 - Introduction (Continued...)  
Lecture 5 - Introduction (Continued...)  
Lecture 6 - Introduction (Continued...)  
Lecture 7 - Operating System Structures  
Lecture 8 - Operating System Structures (Continued...)  
Lecture 9 - Operating System Structures (Continued...)  
Lecture 10 - Operating System Structures (Continued...)  
Lecture 11 - Operating System Structures (Continued...)  
Lecture 12 - Processes  
Lecture 13 - Processes (Continued...)  
Lecture 14 - Processes (Continued...)  
Lecture 15 - Processes (Continued...)  
Lecture 16 - Processes (Continued...)  
Lecture 17 - Processes (Continued...)  
Lecture 18 - Processes (Continued...)  
Lecture 19 - Threads  
Lecture 20 - Threads (Continued...)  
Lecture 21 - Threads (Continued...)  
Lecture 22 - Threads (Continued...)  
Lecture 23 - Threads, Scheduling  
Lecture 24 - Scheduling  
Lecture 25 - Scheduling (Continued...)  
Lecture 26 - Scheduling (Continued...)  
Lecture 27 - Scheduling (Continued...)  
Lecture 28 - Scheduling (Continued...)  
Lecture 29 - Process Synchronization

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Process Synchronization (Continued...)
- Lecture 31 - Process Synchronization (Continued...)
- Lecture 32 - Process Synchronization (Continued...)
- Lecture 33 - Process Synchronization (Continued...)
- Lecture 34 - Process Synchronization (Continued...)
- Lecture 35 - Synchronization Examples
- Lecture 36 - Synchronization Examples, Deadlock
- Lecture 37 - Deadlock
- Lecture 38 - Deadlock (Continued...)
- Lecture 39 - Deadlock (Continued...)
- Lecture 40 - Deadlock (Continued...)
- Lecture 41 - Memory Management
- Lecture 42 - Memory Management (Continued...)
- Lecture 43 - Memory Management (Continued...)
- Lecture 44 - Memory Management (Continued...)
- Lecture 45 - Memory Management (Continued...)
- Lecture 46 - Memory Management (Continued...)
- Lecture 47 - Memory Management (Continued...)
- Lecture 48 - Memory Management (Continued...)
- Lecture 49 - Virtual Memory
- Lecture 50 - Virtual Memory (Continued...)
- Lecture 51 - Virtual Memory (Continued...)
- Lecture 52 - Virtual Memory (Continued...)
- Lecture 53 - Virtual Memory (Continued...)
- Lecture 54 - Virtual Memory (Continued...)
- Lecture 55 - Virtual Memory (Continued...)
- Lecture 56 - Virtual Memory (Continued...)
- Lecture 57 - File System and Secondary Storage
- Lecture 58 - File System and Secondary Storage (Continued...)
- Lecture 59 - File System and Secondary Storage (Continued...)
- Lecture 60 - File System and Secondary Storage (Continued...)

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Deep Learning (Prof. P.K. Biswas)

Subject Co-ordinator - Prof. P.K. Biswas

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Feature Descriptor - I  
Lecture 3 - Feature Descriptor - II  
Lecture 4 - Bayesian Learning - I  
Lecture 5 - Bayesian Learning - II  
Lecture 6 - Discriminant Function - I  
Lecture 7 - Discriminant Function - II  
Lecture 8 - Discriminant Function - III  
Lecture 9 - Linear Classifier - I  
Lecture 10 - Linear Classifier - II  
Lecture 11 - Support Vector Machine - I  
Lecture 12 - Support Vector Machine - II  
Lecture 13 - Linear Machine  
Lecture 14 - Multiclass Support Vector Machine - I  
Lecture 15 - Multiclass Support Vector Machine - II  
Lecture 16 - Optimization  
Lecture 17 - Optimization Techniques in Machine Learning  
Lecture 18 - Nonlinear Functions  
Lecture 19 - Introduction to Neural Network  
Lecture 20 - Neural Network - II  
Lecture 21 - Multilayer Perceptron - I  
Lecture 22 - Multilayer Perceptron - II  
Lecture 23 - Backpropagation Learning  
Lecture 24 - Loss Function  
Lecture 25 - Backpropagation Learning- Example - I  
Lecture 26 - Backpropagation Learning- Example - II  
Lecture 27 - Backpropagation Learning- Example - III  
Lecture 28 - Autoencoder  
Lecture 29 - Autoencoder Vs PCA - I

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Autoencoder Vs PCA - II
- Lecture 31 - Autoencoder Training
- Lecture 32 - Autoencoder Variants - I
- Lecture 33 - Autoencoder Variants - II
- Lecture 34 - Convolution
- Lecture 35 - Cross Correlation
- Lecture 36 - CNN Architecture
- Lecture 37 - MLP versus CNN, Popular CNN Architecture
- Lecture 38 - Popular CNN Architecture
- Lecture 39 - Popular CNN Architecture
- Lecture 40 - Vanishing and Exploding Gradient
- Lecture 41 - GoogleNet
- Lecture 42 - ResNet, Optimisers
- Lecture 43 - Optimisers
- Lecture 44 - Optimisers
- Lecture 45 - Optimisers
- Lecture 46 - Normalization
- Lecture 47 - Batch Normalization - I
- Lecture 48 - Batch Normalization - II
- Lecture 49 - Layer, Instance, Group Normalization
- Lecture 50 - Training Trick, Regularization, Early Stopping
- Lecture 51 - Face Recognition
- Lecture 52 - Deconvolution Layer
- Lecture 53 - Semantic Segmentation - I
- Lecture 54 - Semantic Segmentation - II
- Lecture 55 - Semantic Segmentation - III
- Lecture 56 - Image Denoising
- Lecture 57 - Variational Autoencoder - I
- Lecture 58 - Variational Autoencoder - II
- Lecture 59 - Variational Autoencoder - III
- Lecture 60 - Generative Adversarial Network

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computer Vision

Subject Co-ordinator - Prof. Jayanta Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Fundamentals of Image Processing - Part I
- Lecture 2 - Fundamentals of Image Processing - Part II
- Lecture 3 - Image Transform - Part I
- Lecture 4 - Image Transform - Part II
- Lecture 5 - Projective Geometry - Part I
- Lecture 6 - Projective Geometry - Part II
- Lecture 7 - Projective Transformation
- Lecture 8 - Homography
- Lecture 9 - Homography
- Lecture 10 - Homography
- Lecture 11 - Camera Geometry - Part I
- Lecture 12 - Camera Geometry - Part II
- Lecture 13 - Camera Geometry - Part III
- Lecture 14 - Camera Geometry - Part IV
- Lecture 15 - Camera Geometry - Part V
- Lecture 16 - Stereo Geometry - Part I
- Lecture 17 - Stereo Geometry - Part II
- Lecture 18 - Stereo Geometry - Part III
- Lecture 19 - Stereo Geometry - Part IV
- Lecture 20 - Stereo Geometry - Part V
- Lecture 21 - Stereo Geometry - Part VI
- Lecture 22 - Stereo Geometry - Part VII
- Lecture 23 - Stereo Geometry - Part VIII
- Lecture 24 - Feature Detection And Description - Part I
- Lecture 25 - Feature Detection And Description - Part II
- Lecture 26 - Feature Detection And Description - Part III
- Lecture 27 - Feature Detection And Description - Part IV
- Lecture 28 - Feature Detection And Description - Part V
- Lecture 29 - Feature Matching And Model Fitting- Part I

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Feature Matching And Model Fitting- Part II
- Lecture 31 - Feature Matching And Model Fitting- Part III
- Lecture 32 - Feature Matching And Model Fitting- Part IV
- Lecture 33 - Feature Matching And Model Fitting- Part V
- Lecture 34 - Color Fundamentals And Processing-Part I
- Lecture 35 - Color Fundamentals And Processing-Part II
- Lecture 36 - Color Fundamentals And Processing-Part III
- Lecture 37 - Color Fundamentals And Processing-Part IV
- Lecture 38 - Color Fundamentals And Processing-Part V
- Lecture 39 - Color Fundamentals And Processing-Part VI
- Lecture 40 - Color Fundamentals And Processing-Part VII
- Lecture 41 - Range Image Processing - Part I
- Lecture 42 - Range Image Processing - Part II
- Lecture 43 - Range Image Processing - Part III
- Lecture 44 - Range Image Processing - Part IV
- Lecture 45 - Range Image Processing - Part V
- Lecture 46 - Clustering and Classification - Part I
- Lecture 47 - Clustering and Classification - Part II
- Lecture 48 - Clustering and Classification - Part III
- Lecture 49 - Clustering and Classification - Part IV
- Lecture 50 - Clustering and Classification - Part V
- Lecture 51 - Dimensional Reduction And Sparse Representation - Part I
- Lecture 52 - Dimensional Reduction And Sparse Representation - Part II
- Lecture 53 - Dimensional Reduction And Sparse Representation - Part III
- Lecture 54 - Dimensional Reduction And Sparse Representation - Part IV
- Lecture 55 - Deep Neural Architecture And Applications - Part I
- Lecture 56 - Deep Neural Architecture And Applications - Part II
- Lecture 57 - Deep Neural Architecture And Applications - Part III
- Lecture 58 - Deep Neural Architecture And Applications - Part IV
- Lecture 59 - Deep Neural Architecture And Applications - Part V
- Lecture 60 - Deep Neural Architecture And Applications - Part VI

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Ethical Hacking

Subject Co-ordinator - Prof. Indranil Sengupta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Ethical Hacking
- Lecture 2 - Basic Concepts of Networking - Part I
- Lecture 3 - Basic Concepts of Networking - Part II
- Lecture 4 - TCP/IP Protocol Stack - Part I
- Lecture 5 - TCP/IP Protocol Stack - Part II
- Lecture 6 - IP addressing and routing - Part I
- Lecture 7 - IP addressing and routing - Part II
- Lecture 8 - TCP and UDP - Part I
- Lecture 9 - TCP and UDP - Part II
- Lecture 10 - IP subnetting
- Lecture 11 - Routing protocols - Part I
- Lecture 12 - Routing protocols - Part II
- Lecture 13 - Routing protocols - Part III
- Lecture 14 - IP version 6
- Lecture 15 - Routing examples
- Lecture 16 - Demonstration - Part I
- Lecture 17 - Demonstration - Part II
- Lecture 18 - Demonstration - Part III
- Lecture 19 - Nessus Installation
- Lecture 20 - How to use nessus
- Lecture 21 - Metasploit Exploiting System Software - I
- Lecture 22 - Metasploit Exploiting System Software - II
- Lecture 23 - Metasploit Exploiting System Software and Privilege
- Lecture 24 - Metasploit Social Eng Attack
- Lecture 25 - MITM (Man in The middle) Attack
- Lecture 26 - Basic concepts of cryptography
- Lecture 27 - Private-key cryptography - Part I
- Lecture 28 - Private-key cryptography - Part II
- Lecture 29 - Public-key cryptography - Part I

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Public-key cryptography - Part II
- Lecture 31 - Cryptographic hash functions - Part I
- Lecture 32 - Cryptographic hash functions - Part II
- Lecture 33 - Digital signature and certificate
- Lecture 34 - Applications - Part I
- Lecture 35 - Applications - Part II
- Lecture 36 - Steganography
- Lecture 37 - Biometrics
- Lecture 38 - Network Based Attacks - Part I
- Lecture 39 - Network Based Attacks - Part II
- Lecture 40 - DNS and Email Security
- Lecture 41 - Password cracking
- Lecture 42 - Phishing attack
- Lecture 43 - Maloeware
- Lecture 44 - Wifi hacking
- Lecture 45 - Dos and DDos attack
- Lecture 46 - Elements of Hardware Security
- Lecture 47 - Side Channel Attacks - Part I
- Lecture 48 - Side Channel Attacks - Part II
- Lecture 49 - Physical Unclonable Function
- Lecture 50 - Hardware Trojan
- Lecture 51 - Web Application Vulnerability Scanning
- Lecture 52 - SQL Injection Authentication Bypass - Part 1
- Lecture 53 - SQL Injection Error Based - Part 2
- Lecture 54 - SQL Injection Error Based from Web Application - Part 3
- Lecture 55 - SQLMAP
- Lecture 56 - Cross Site Scripting
- Lecture 57 - File Upload Vulnerability
- Lecture 58 - The NMAP Tool
- Lecture 59 - The NMAP Tool
- Lecture 60 - The NMAP Tool
- Lecture 61 - Network Analysis using Wireshark
- Lecture 62 - Summarization of the Course

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Software Project Management

Subject Co-ordinator - Prof. Durga Prasad Mohapatra

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction - I  
Lecture 2 - Introduction - II  
Lecture 3 - Introduction - III  
Lecture 4 - Project Management Standards  
Lecture 5 - Life Cycle Models - I  
Lecture 6 - Life Cycle Models - II  
Lecture 7 - Life Cycle Models - III  
Lecture 8 - Life Cycle Models - IV  
Lecture 9 - Life Cycle Models - V  
Lecture 10 - Life Cycle Models - VI  
Lecture 11 - Project Evaluation and Programme Management  
Lecture 12 - Project Evaluation and Programme Management (Continued...)  
Lecture 13 - Project Evaluation and Programme Management (Continued...)  
Lecture 14 - Project Evaluation and Programme Management (Continued...)  
Lecture 15 - Project Evaluation and Programme Management (Continued...)  
Lecture 16 - Project Estimation Techniques  
Lecture 17 - Project Estimation Techniques (Continued...)  
Lecture 18 - Project Estimation Techniques (Continued...)  
Lecture 19 - Project Estimation Techniques (Continued...)  
Lecture 20 - Project Estimation Techniques (Continued...)  
Lecture 21 - Project Estimation Techniques (Continued...)  
Lecture 22 - Project Estimation Techniques (Continued...)  
Lecture 23 - Project Estimation Techniques (Continued...)  
Lecture 24 - Project Estimation Techniques (Continued...)  
Lecture 25 - Project Estimation Techniques (Continued...)  
Lecture 26 - Project Scheduling  
Lecture 27 - Project Scheduling Using PERT/CPM  
Lecture 28 - Project Scheduling Using PERT/CPM (Continued...)  
Lecture 29 - Computation of Project Characteristics Using PERT/CPM

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Computation of Project Characteristics Using PERT/CPM
- Lecture 31 - PERT, Project Crashing
- Lecture 32 - Team Management
- Lecture 33 - Organization and Team Structure
- Lecture 34 - Team Structure (Continued...) and Risk Management
- Lecture 35 - Risk Management (Continued...) and Introduction to Software Quality
- Lecture 36 - Resource Allocation
- Lecture 37 - Resource Allocation (Continued...)
- Lecture 38 - Resource Allocation (Continued...)
- Lecture 39 - Project Monitoring and Control
- Lecture 40 - Project Monitoring and Control (Continued...)
- Lecture 41 - Project Monitoring and Control (Continued...)
- Lecture 42 - Project Monitoring and Control (Continued...)
- Lecture 43 - Project Monitoring and Control (Continued...)
- Lecture 44 - Project Monitoring and Control (Continued...)
- Lecture 45 - Project Monitoring and Control (Continued...)
- Lecture 46 - Project Monitoring and Control (Continued...)
- Lecture 47 - Project Monitoring and Control (Continued...)
- Lecture 48 - Contract Management
- Lecture 49 - Contract Management (Continued...)
- Lecture 50 - Project Close Out
- Lecture 51 - Software Quality Management
- Lecture 52 - ISO 9000
- Lecture 53 - ISO 9001, SEI CMM
- Lecture 54 - SEI CMM (Continued...)
- Lecture 55 - SEI CMM (Continued...)
- Lecture 56 - Personal Software Process (PSP)
- Lecture 57 - Software Reliability - I
- Lecture 58 - Software Reliability - II
- Lecture 59 - Software Reliability - III
- Lecture 60 - Software Testing

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Spatial Informatics

Subject Co-ordinator - Prof. Soumya Kanti Ghosh

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Spatial Data Models - 1  
Lecture 3 - Spatial Data Models - 2  
Lecture 4 - Spatial Data Models - 3  
Lecture 5 - Spatial Data Models - 4  
Lecture 6 - Spatial Web Services - 1  
Lecture 7 - Spatial Web Services - 2  
Lecture 8 - Spatial Web Services - 3  
Lecture 9 - Spatial Web Services - 4  
Lecture 10 - Spatial Web Services - Demo  
Lecture 11 - Spatial Database  
Lecture 12 - Spatial Query Processing / SQL - 1  
Lecture 13 - Spatial Query Processing / SQL - 2  
Lecture 14 - Spatial Query Processing / SQL - 3  
Lecture 15 - Spatial Query Processing / SQL - 4  
Lecture 16 - Spatial Query Demo Tutorial  
Lecture 17 - Spatial Indexing - I  
Lecture 18 - Spatial Indexing - II  
Lecture 19 - Spatial Indexing - III  
Lecture 20 - Spatial Indexing - IV  
Lecture 21 - Spatial Networks - I  
Lecture 22 - Spatial Networks - II  
Lecture 23 - Spatial Networks - III  
Lecture 24 - Spatial Networks - IV  
Lecture 25 - Spatial Networks - V  
Lecture 26 - Spatial Analysis - I  
Lecture 27 - Spatial Analysis - II  
Lecture 28 - Spatial Analysis - III  
Lecture 29 - Spatial Analysis - IV

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Spatial Analysis - V
- Lecture 31 - Remote Sensing and GIS - I
- Lecture 32 - Remote Sensing and GIS - II
- Lecture 33 - Remote Sensing and GIS - III
- Lecture 34 - Remote Sensing and GIS - IIV
- Lecture 35 - Remote Sensing and GIS - V
- Lecture 36 - SDS / Spatial Cloud / GeoViz - I
- Lecture 37 - SDS / Spatial Cloud / GeoViz - II
- Lecture 38 - SDS / Spatial Cloud / GeoViz - III
- Lecture 39 - SDS / Spatial Cloud / GeoViz - IV
- Lecture 40 - SDS / Spatial Cloud / GeoViz - V

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:GPU Architectures and Programming

Subject Co-ordinator - Prof. Soumyajit Dey

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Review of basic COA w.r.t. performance
- Lecture 2 - Review of basic COA w.r.t. performance
- Lecture 3 - Review of basic COA w.r.t. performance
- Lecture 4 - Review of basic COA w.r.t. performance
- Lecture 5 - Intro to GPU architectures
- Lecture 6 - Intro to GPU architectures
- Lecture 7 - Intro to GPU architectures
- Lecture 8 - Intro to GPU architectures
- Lecture 9 - Intro to CUDA programming
- Lecture 10 - Intro to CUDA programming (Continued...)
- Lecture 11 - Intro to CUDA programming (Continued...)
- Lecture 12 - Intro to CUDA programming (Continued...)
- Lecture 13 - Multi-dimensional mapping of dataspace; Synchronization
- Lecture 14 - Multi-dimensional mapping of dataspace; Synchronization (Continued...)
- Lecture 15 - Multi-dimensional mapping of dataspace; Synchronization (Continued...)
- Lecture 16 - Warp Scheduling and Divergence
- Lecture 17 - Warp Scheduling and Divergence (Continued...)
- Lecture 18 - Warp Scheduling and Divergence (Continued...)
- Lecture 19 - Memory Access Coalescing
- Lecture 20 - Memory Access Coalescing (Continued...)
- Lecture 21 - Memory Access Coalescing (Continued...)
- Lecture 22 - Memory Access Coalescing (Continued...)
- Lecture 23 - Memory Access Coalescing (Continued...)
- Lecture 24 - Memory Access Coalescing (Continued...)
- Lecture 25 - Memory Access Coalescing (Continued...)
- Lecture 26 - Memory Access Coalescing (Continued...)
- Lecture 27 - Memory Access Coalescing (Continued...)
- Lecture 28 - Optimizing Reduction Kernels
- Lecture 29 - Optimizing Reduction Kernels (Continued...)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Optimizing Reduction Kernels (Continued...)
- Lecture 31 - Optimizing Reduction Kernels (Continued...)
- Lecture 32 - Optimizing Reduction Kernels (Continued...)
- Lecture 33 - Optimizing Reduction Kernels (Continued...)
- Lecture 34 - Optimizing Reduction Kernels (Continued...)
- Lecture 35 - Kernel Fusion, Thread and Block Coarsening
- Lecture 36 - Kernel Fusion, Thread and Block Coarsening (Continued...)
- Lecture 37 - Kernel Fusion, Thread and Block Coarsening (Continued...)
- Lecture 38 - Kernel Fusion, Thread and Block Coarsening (Continued...)
- Lecture 39 - Kernel Fusion, Thread and Block Coarsening (Continued...)
- Lecture 40 - Kernel Fusion, Thread and Block Coarsening (Continued...)
- Lecture 41 - OpenCL - Runtime System
- Lecture 42 - OpenCL - Runtime System (Continued...)
- Lecture 43 - OpenCL - Runtime System (Continued...)
- Lecture 44 - OpenCL - Runtime System (Continued...)
- Lecture 45 - OpenCL - Runtime System (Continued...)
- Lecture 46 - OpenCL - Runtime System (Continued...)
- Lecture 47 - OpenCL - Runtime System (Continued...)
- Lecture 48 - OpenCL - Heterogeneous Computing
- Lecture 49 - OpenCL - Heterogeneous Computing (Continued...)
- Lecture 50 - OpenCL - Heterogeneous Computing (Continued...)
- Lecture 51 - OpenCL - Heterogeneous Computing (Continued...)
- Lecture 52 - OpenCL - Heterogeneous Computing (Continued...)
- Lecture 53 - OpenCL - Heterogeneous Computing (Continued...)
- Lecture 54 - Efficient Neural Network Training/Inferencing
- Lecture 55 - Efficient Neural Network Training/Inferencing (Continued...)
- Lecture 56 - Efficient Neural Network Training/Inferencing (Continued...)
- Lecture 57 - Efficient Neural Network Training/Inferencing (Continued...)
- Lecture 58 - Efficient Neural Network Training/Inferencing (Continued...)
- Lecture 59 - Efficient Neural Network Training/Inferencing (Continued...)
- Lecture 60 - Efficient Neural Network Training/Inferencing (Continued...)
- Lecture 61 - Efficient Neural Network Training/Inferencing (Continued...)
- Lecture 62 - Efficient Neural Network Training/Inferencing (Continued...)
- Lecture 63 - Efficient Neural Network Training/Inferencing (Continued...)

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Google Cloud Computing Foundation Course

Subject Co-ordinator - Prof. Soumya Kanti Ghosh

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Cloud  
Lecture 2 - Cloud Computing  
Lecture 3 - Cloud vs Traditional Architecture  
Lecture 4 - IaaS, PaaS and SaaS  
Lecture 5 - Google Cloud Architecture  
Lecture 6 - Cloud Computing Recap Quiz  
Lecture 7 - Summary - Cloud Computing  
Lecture 8 - Introduction - Start with a Solid Platform  
Lecture 9 - The GCP Console  
Lecture 10 - Understanding Projects  
Lecture 11 - Billing in GCP  
Lecture 12 - Install and Configure Cloud SDK  
Lecture 13 - Use Cloud Shell  
Lecture 14 - GCP APIs  
Lecture 15 - Cloud Console Mobile App  
Lecture 16 - Recap Quiz - Start with a Solid Foundation  
Lecture 17 - Introduction  
Lecture 18 - Compute Options in the Cloud  
Lecture 19 - Exploring IaaS with Compute Engine  
Lecture 20 - Configuring Elastic Apps with Autoscaling  
Lecture 21 - Exploring PaaS with App Engine  
Lecture 22 - Event Driven Programs with Cloud Functions  
Lecture 23 - Containerizing and Orchestrating Apps with GKE  
Lecture 24 - Summary  
Lecture 25 - Introduction  
Lecture 26 - Storage Options in the Cloud  
Lecture 27 - Structured and Unstructured Storage in the Cloud  
Lecture 28 - Unstructured Storage using Cloud Storage  
Lecture 29 - SQL Managed Services

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Exploring Cloud SQL
- Lecture 31 - Cloud Spanner as a Managed Service
- Lecture 32 - NoSQL Managed Services Options
- Lecture 33 - Cloud Datastore a NoSQL Document Store
- Lecture 34 - Cloud Bigtable as a NoSQL Option
- Lecture 35 - Summary
- Lecture 36 - Introduction to API
- Lecture 37 - The Purpose of APIs
- Lecture 38 - Cloud Endpoints
- Lecture 39 - Using Apigee
- Lecture 40 - Managed Message Services
- Lecture 41 - Cloud Pub/Sub
- Lecture 42 - Recap Quiz - There's an API for that!
- Lecture 43 - Introduction - Cloud Security
- Lecture 44 - Introduction to security in the cloud
- Lecture 45 - Understanding the shared security model
- Lecture 46 - Explore encryption options
- Lecture 47 - Understand authentication and authorization
- Lecture 48 - Identify best practices for authorization
- Lecture 49 - Recap Quiz - Security
- Lecture 50 - Summary - Security
- Lecture 51 - Introduction
- Lecture 52 - Intro to Networking in the Cloud
- Lecture 53 - Defining a Virtual Private Cloud
- Lecture 54 - Public and Private IP Address Basics
- Lecture 55 - Googles Network Architecture
- Lecture 56 - Routes and Firewall Rules in the Cloud
- Lecture 57 - Multiple VPC Networks
- Lecture 58 - Building Hybrid Clouds
- Lecture 59 - Different Options for Load Balancing
- Lecture 60 - Recap Quiz
- Lecture 61 - Summary
- Lecture 62 - Introduction - Let Google keep an eye on things
- Lecture 63 - Introduction to IaC
- Lecture 64 - Cloud Deployment Manager
- Lecture 65 - Monitoring and Managing Your Services, Apps, and Infra
- Lecture 66 - Stackdriver
- Lecture 67 - Recap Quiz - Let Google keep an eye on things
- Lecture 68 - Summary - Let Google keep an eye on things

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Introduction - You have the data, but what are you doing with it?
- Lecture 70 - Intro to Big Data Managed Services in the Cloud
- Lecture 71 - Leverage Big Data Operations with Cloud Dataproc
- Lecture 72 - Build ETL Pipelines using Cloud Dataflow
- Lecture 73 - BigQuery Googles Enterprise Data Warehouse
- Lecture 74 - Recap Quiz - You have the data, but what are you doing with it?
- Lecture 75 - Summary - You have the data, but what are you doing with it?
- Lecture 76 - Introduction
- Lecture 77 - Introduction to ML
- Lecture 78 - ML and GCP
- Lecture 79 - Building Bespoke ML models
- Lecture 80 - Cloud AutoML
- Lecture 81 - Googles Pre-trained ML APIs
- Lecture 82 - Recap Quiz
- Lecture 83 - Summary

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Object Oriented System Development using UML, Java

Subject Co-ordinator - Prof. Rajib Mall

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Basic Concepts in UML
- Lecture 3 - Introduction to Use case Modelling
- Lecture 4 - Factoring Use Cases
- Lecture 5 - Use Case Examples
- Lecture 6 - Use Case Guidelines
- Lecture 7 - Class Diagram
- Lecture 8 - Class Relations
- Lecture 9 - Binary and Unary Associations
- Lecture 10 - Implementation of Association Relation in Java
- Lecture 11 - Implementation of Association in General Case
- Lecture 12 - Association Class and Ternary Association
- Lecture 13 - Qualified Association
- Lecture 14 - Aggregation and Composition
- Lecture 15 - Dependency Relation
- Lecture 16 - Class Diagram Exercises
- Lecture 17 - Interfaces, Packages and Abstract Classes
- Lecture 18 - Polymorphism
- Lecture 19 - State Machine Diagrams
- Lecture 20 - State Charts Overview
- Lecture 21 - Features of State Machine Model
- Lecture 22 - Example of State Machine Modelling
- Lecture 23 - Encoding a State Machine - I
- Lecture 24 - Encoding a State Machine - II
- Lecture 25 - Interaction Diagrams
- Lecture 26 - Sequence Diagram - I
- Lecture 27 - Sequence Diagram - II
- Lecture 28 - Activity Diagram
- Lecture 29 - Introduction to OOAD

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - OOAD - I
- Lecture 31 - OOAD - II
- Lecture 32 - Example Application of OOAD
- Lecture 33 - CRD Cards
- Lecture 34 - Open/Closed Principle
- Lecture 35 - LSP, ISP Principles
- Lecture 36 - DIP Principle
- Lecture 37 - Introduction to Design Pattern
- Lecture 38 - GRASP Pattern
- Lecture 39 - Expert and Creator Pattern
- Lecture 40 - Pure Fabrication, Law of Demeter
- Lecture 41 - Introduction to GOF Patterns
- Lecture 42 - Facade Pattern
- Lecture 43 - Observer Pattern - I
- Lecture 44 - Observer Pattern - II
- Lecture 45 - Singleton Pattern - I
- Lecture 46 - Singleton Pattern - II
- Lecture 47 - State Pattern - I
- Lecture 48 - State Pattern - II
- Lecture 49 - Composite Pattern - I
- Lecture 50 - Composite Pattern - II
- Lecture 51 - Adapter Pattern - I
- Lecture 52 - Adapter Pattern - II
- Lecture 53 - Bridge Pattern - I
- Lecture 54 - Bridge Pattern - II
- Lecture 55 - Proxy Pattern - I
- Lecture 56 - Proxy Pattern - II
- Lecture 57 - Decorator Pattern - I
- Lecture 58 - Decorator Pattern - II
- Lecture 59 - Decorator Pattern - III
- Lecture 60 - Iterator Pattern

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Data Structure and Algorithms using Java

Subject Co-ordinator - Prof. Debasis Samanta

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction and Course Plan
- Lecture 2 - Generic Methods
- Lecture 3 - Basics of Generic Class
- Lecture 4 - Parameterized Generic Class
- Lecture 5 - Bounded Argument Generic Class
- Lecture 6 - Basics of the Framework
- Lecture 7 - Collection in JCF
- Lecture 8 - Set of JCF
- Lecture 9 - Map Framework
- Lecture 10 - Java Legacy Classes
- Lecture 11 - Array Data Structures
- Lecture 12 - Programming for Arrays
- Lecture 13 - Class ArrayList for Arrays
- Lecture 14 - Arrays for Arrays
- Lecture 15 - Vector Class for Arrays
- Lecture 16 - Linked List Data Structure - Part I
- Lecture 17 - Linked List Data Structure - Part II
- Lecture 18 - Programming for Linked Lists - Part I
- Lecture 19 - Programming for Linked Lists - Part II
- Lecture 20 - Linked Lists Using JCF
- Lecture 21 - Stack Data Structures
- Lecture 22 - Programming for Stack
- Lecture 23 - Stack Using JCF
- Lecture 24 - Queue Data Structure
- Lecture 25 - Programming for Queue
- Lecture 26 - Queue Using JCF
- Lecture 27 - Understanding Tree Data Structures
- Lecture 28 - Operations on Binary Tree Data Structures
- Lecture 29 - Binary Search Tree

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Programming for Binary Search Tree
- Lecture 31 - Height Balanced Binary Search Tree
- Lecture 32 - Heap Tree
- Lecture 33 - Programming for Heap Tree
- Lecture 34 - Huffman Tree
- Lecture 35 - Graph Structures
- Lecture 36 - Graph Algorithms
- Lecture 37 - Map Framework in Java
- Lecture 38 - Applications of Map - Part I
- Lecture 39 - Applications of Map - Part II
- Lecture 40 - Collection Set
- Lecture 41 - Operations on Set Collection
- Lecture 42 - Introduction to java.io
- Lecture 43 - IO with Byte Streams
- Lecture 44 - IO with Character Streams
- Lecture 45 - File Input-Output
- Lecture 46 - Random Access File
- Lecture 47 - Linear Searching Algorithms
- Lecture 48 - Non-linear Searching Algorithms
- Lecture 49 - Programs for Searching
- Lecture 50 - Sorting Algorithms - Part I
- Lecture 51 - Improved Sorting Algorithms
- Lecture 52 - Advanced Sorting Algorithms
- Lecture 53 - Programs for Sorting - Part I
- Lecture 54 - Programs for Sorting - Part II
- Lecture 55 - Sorting Using JCF
- Lecture 56 - String Class
- Lecture 57 - Applications of String
- Lecture 58 - StringBuffer Class
- Lecture 59 - Miscellaneous Utilities
- Lecture 60 - Java Cursors

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Real-Time Systems

Subject Co-ordinator - Prof. Rajib Mall

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Introduction
- Lecture 3 - Characteristics of a real-time embedded system
- Lecture 4 - Characteristics of a real-time embedded system
- Lecture 5 - Types of real-time tasks
- Lecture 6 - Events in a Real-Time System
- Lecture 7 - Types of time constraints
- Lecture 8 - Basics of Real-Time Task scheduling
- Lecture 9 - Clock-driven schedulers
- Lecture 10 - Basics of Cyclic schedulers
- Lecture 11 - Cyclic Scheduler
- Lecture 12 - Frame size constraints
- Lecture 13 - Frame size selection: Examples
- Lecture 14 - Event-driven scheduling
- Lecture 15 - EDF scheduler
- Lecture 16 - Variants of EDF and Rate Monotonic Scheduling
- Lecture 17 - Rate Monotonic Schedulability Analysis
- Lecture 18 - Rate Monotonic Schedulability Analysis
- Lecture 19 - Rate Monotonic Scheduling: Miscellaneous issues
- Lecture 20 - RMS Generalizations
- Lecture 21 - RMS Generalizations
- Lecture 22 - Handling aperiodic and sporadic tasks in rate monotonic scheduling
- Lecture 23 - Handling aperiodic and sporadic tasks in rate monotonic scheduling
- Lecture 24 - Coping up with Insufficient number of priorities
- Lecture 25 - Handling task jitter and precedence ordering
- Lecture 26 - Resource Sharing Among Real-Time Tasks
- Lecture 27 - Basic priority inheritance protocol (PIP)
- Lecture 28 - Highest Locker Protocol (HLP)
- Lecture 29 - Priority Ceiling Protocol (PCP)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Working of Priority Ceiling Protocol
- Lecture 31 - Analysis of Priority Ceiling Protocol
- Lecture 32 - Introduction to Multiprocessor and Distributed Systems
- Lecture 33 - Static Allocation of Tasks
- Lecture 34 - Dynamic Allocation of Tasks
- Lecture 35 - Centralized Clock Synchronization in Distributed RT Systems
- Lecture 36 - Distributed Clock Synchronization in R-T Systems
- Lecture 37 - A Few Basics in Real-Time Operating Systems
- Lecture 38 - Time Services
- Lecture 39 - Unix as a Real-Time Operating System
- Lecture 40 - Unix as a Real-Time Operating System (Continued...)
- Lecture 41 - Windows as RTOS
- Lecture 42 - POSIX
- Lecture 43 - Unix-Based Real-Time Operating Systems
- Lecture 44 - A survey of some contemporary Real-Time Operating Systems
- Lecture 45 - A survey of some contemporary Real-Time Operating Systems (Continued...)
- Lecture 46 - Benchmarking Real-Time Systems
- Lecture 47 - Introduction to Real-Time Communication
- Lecture 48 - Basics of Real-Time Communication
- Lecture 49 - Basics of Networking
- Lecture 50 - Basics of Internet
- Lecture 51 - Real-Time Communication in a LAN
- Lecture 52 - Bounded Access Protocols for LANs
- Lecture 53 - Performance Comparison and QoS Framework
- Lecture 54 - Routing and Resource Reservation
- Lecture 55 - Rate Control
- Lecture 56 - QoS Models and Soft Real-Time Communication in a LAN
- Lecture 57 - Review of Basic Database Concepts
- Lecture 58 - Applications and Issues of Real-Time Database
- Lecture 59 - Characteristics of Temporal Data
- Lecture 60 - Locking-Based Concurrency Control In Real-Time Databases
- Lecture 61 - Concurrency Control In Real-Time Databases and Commercial RT Databases



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Algorithms for Protein Modelling and Engineering

Subject Co-ordinator - Prof. Pralay Mitra

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction on Proteins
- Lecture 2 - Introduction on Proteins (Continued...) and Sequence Database
- Lecture 3 - Protein Data Bank
- Lecture 4 - PDB Parsing
- Lecture 5 - Molecular Visualization Tools
- Lecture 6 - Representation and Data Structure
- Lecture 7 - Digitization of a Molecule
- Lecture 8 - Application to Protein Docking, FFT
- Lecture 9 - Implementation Details
- Lecture 10 - Hashing
- Lecture 11 - Geometric Hashing
- Lecture 12 - Geometric Hashing (Continued...)
- Lecture 13 - Geometric Hashing (Continued...)
- Lecture 14 - Molecular Surface
- Lecture 15 - Genetic Algorithm (GA) for Surface Comparison
- Lecture 16 - Monte Carlo (MC) Method
- Lecture 17 - Monte Carlo Method (Continued...) and Random Number
- Lecture 18 - Monte Carlo (MC) Method (Continued...)
- Lecture 19 - Protein Folding
- Lecture 20 - Protein Folding (Continued...) and Protein Design
- Lecture 21 - Protein Energy Landscape
- Lecture 22 - Protein Energy Landscape (Continued...), Limitation of MC
- Lecture 23 - Replica Exchange Monte Carlo (REMC)
- Lecture 24 - Ab Initio Protein Folding
- Lecture 25 - Structure Alignment Measures
- Lecture 26 - Dynamic Programming
- Lecture 27 - Dynamic Programming (Continued...), Sequence Alignment
- Lecture 28 - Dynamic Programming (Continued...), Position Specific Scoring Matrix (PSSM)
- Lecture 29 - Structure Alignment

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Structure Alignment (Continued...)
- Lecture 31 - Structural Classification of Proteins (SCOP)
- Lecture 32 - SCOP (Continued...), Symmetry in Proteins
- Lecture 33 - Symmetry in Proteins
- Lecture 34 - Discriminating Biological Protein Interfaces from Crystal Artifacts
- Lecture 35 - Discriminating Biological Protein Interfaces from Crystal Artifacts (Continued...)
- Lecture 36 - Discriminating Biological Protein Interfaces from Crystal Artifacts (Continued...)
- Lecture 37 - Discriminating Biological Protein Interfaces from Crystal Artifacts (Continued...)
- Lecture 38 - Symmetry-Based Protein Complex Modeling
- Lecture 39 - Some Protein Docking Methods
- Lecture 40 - Some Protein Docking Methods (Continued...)
- Lecture 41 - Computational Protein Design (CPD)
- Lecture 42 - Computational Protein Design (CPD) (Continued...)
- Lecture 43 - Protein Design Energy Function
- Lecture 44 - Protein Design Analysis
- Lecture 45 - Application of Protein Design on Drug Design
- Lecture 46 - RECM in Protein Design
- Lecture 47 - Application of Protein Design on Drug Design
- Lecture 48 - Application of Protein Design on Drug Design (Continued...), Protein Modification
- Lecture 49 - Protein Modification (Continued...)
- Lecture 50 - Protein Modification (Continued...)
- Lecture 51 - Assigning Secondary Structure to Protein Sequence
- Lecture 52 - Assigning Secondary Structure to Protein Sequence (Continued...)
- Lecture 53 - Machine Learning to Predict the Secondary Structure from Amino Acid Sequences
- Lecture 54 - Machine Learning to Predict the Secondary Structure from Amino Acid Sequences (Continued...)
- Lecture 55 - Post Translational Modification
- Lecture 56 - Predicting Protein Phosphorylation Sites
- Lecture 57 - Predicting Protein Phosphorylation Sites (Continued...)
- Lecture 58 - Summarizing Protein Folding and Protein Docking
- Lecture 59 - Summarizing Protein Folding and Protein Docking (Continued...)
- Lecture 60 - Summarizing Protein Engineering

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Programming in Modern C++

Subject Co-ordinator - Prof. Partha Pratim Das

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Course Outline  
Lecture 2 - Quick Recap 01: Recap of C/1  
Lecture 3 - Quick Recap 02: Recap of C/2  
Lecture 4 - Course Overview  
Lecture 5 - IO and Loop  
Lecture 6 - Arrays and Strings  
Lecture 7 - Sorting and Searching  
Lecture 8 - Stack and Common Data Structures/Containers  
Lecture 9 - Tutorial 1: How to build a C/C++ program?: Part 1: C Preprocessor (CPP)  
Lecture 10 - Constants and Inline Functions  
Lecture 11 - Reference and Pointer  
Lecture 12 - Default Parameters and Function Overloading  
Lecture 13 - Operator Overloading  
Lecture 14 - Dynamic Memory Management  
Lecture 15 - Tutorial 2: How to build a C/C++ program?: Part 2: Build Pipeline  
Lecture 16 - Static Members  
Lecture 17 - Classes and Objects  
Lecture 18 - Access Specifiers  
Lecture 19 - Constructors, Destructors and Object Lifetime  
Lecture 20 - Copy Constructor and Copy Assignment Operator  
Lecture 21 - Const-ness  
Lecture 22 - Tutorial 3: How to build a C/C++ program?: Part 3: make Utility  
Lecture 23 - Static Members  
Lecture 24 - Friend Function and Friend Class  
Lecture 25 - Overloading Operator for User-Defined Types: Part 1  
Lecture 26 - Overloading Operator for User-Defined Types: Part 2  
Lecture 27 - Namespace  
Lecture 28 - Tutorial 4: How to build a C/C++ program?: Part 4: Static and Dynamic Library  
Lecture 29 - Inheritance: Part 2 (Data Member and Member Function - Override and Overload)

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- Lecture 30 - Inheritance: Part 3 (Constructor and Destructor - Object Lifetime)
- Lecture 31 - Inheritance: Part 4: Phone Hierarchy
- Lecture 32 - Inheritance: Part 5: private and protected Inheritance
- Lecture 33 - Tutorial 5: Mixing C and C++ Code: Part 1: Issues and Resolutions
- Lecture 34 - Polymorphism: Part 1: Type Casting
- Lecture 35 - Polymorphism: Part 2: Static and Dynamic Binding
- Lecture 36 - Polymorphism: Part 3: Abstract Base Class
- Lecture 37 - Polymorphism: Part 4: Staff Salary Processing using C
- Lecture 38 - Polymorphism: Part 5: Staff Salary Processing using C++
- Lecture 39 - Tutorial 6: Mixing C and C++ Code: Part 2: Project Example
- Lecture 40 - Virtual Function Table
- Lecture 41 - Type Casting and Cast Operators: Part 1
- Lecture 42 - Type Casting and Cast Operators: Part 2
- Lecture 43 - Type Casting and Cast Operators: Part 3
- Lecture 44 - Multiple Inheritance
- Lecture 45 - Tutorial 7: How to design a UDT like built-in types?: Part 1: Fraction UDT
- Lecture 46 - Exceptions (Error handling in C): Part 1
- Lecture 47 - Exceptions (Error handling in C++): Part 2
- Lecture 48 - Template (Function Template): Part 1
- Lecture 49 - Template (Class Template): Part 2
- Lecture 50 - Functors: Function Objects
- Lecture 51 - Tutorial 8: How to design a UDT like built-in types?: Part 2: Int and Poly UDT
- Lecture 52 - Input-Output: File Handling in C
- Lecture 53 - Input-Output: Streams in C++
- Lecture 54 - C++ Standard Library: Part 1 (Generic Programming)
- Lecture 55 - C++ Standard Library: Part 2 (STL)
- Lecture 56 - C++ Standard Library: Part 3 (STL)
- Lecture 57 - Tutorial 9: How to design a UDT like built-in types?: Part 3: Updates and Mixes of UDTs
- Lecture 58 - C++11 and beyond: General Features: Part 1
- Lecture 59 - C++11 and beyond: General Features: Part 2
- Lecture 60 - C++11 and beyond: General Features: Part 3
- Lecture 61 - C++11 and beyond: General Features: Part 4: Rvalue and Move/1
- Lecture 62 - C++11 and beyond: General Features: Part 5: Rvalue and Move/2
- Lecture 63 - Tutorial 10: How to optimize C++11 programs using Rvalue and Move Semantics?
- Lecture 64 - C++11 and beyond: General Features: Part 6: Rvalue and Perfect Forwarding
- Lecture 65 - C++11 and beyond: General Features: Part 7: Lambda in C++/1
- Lecture 66 - C++11 and beyond: General Features: Part 8: Lambda in C++/2
- Lecture 67 - C++11 and beyond: Class Features
- Lecture 68 - C++11 and beyond: Non-class Types and Template Features

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Tutorial 11: Compatibility of C and C++: Part 1: Significant Features
- Lecture 70 - C++11 and beyond: Resource Management by Smart Pointers: Part 1
- Lecture 71 - C++11 and beyond: Resource Management by Smart Pointers: Part 2
- Lecture 72 - C++11 and beyond: Concurrency: Part 1
- Lecture 73 - C++11 and beyond: Concurrency: Part 2
- Lecture 74 - Closing Comments
- Lecture 75 - Tutorial 12: Compatibility of C and C++: Part 2: Summary

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Blockchain and its Applications

Subject Co-ordinator - Prof. Sandip Chakraborty, Prof. Shamik Sural

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - The Model of Decentralization
- Lecture 2 - What is Blockchain
- Lecture 3 - Basic Cryptographic Primitives - I
- Lecture 4 - Basic Cryptographic Primitives - II
- Lecture 5 - Basic Cryptographic Primitives - III
- Lecture 6 - Basic Cryptographic Primitives - IV
- Lecture 7 - Basic Cryptographic Primitives - V
- Lecture 8 - Distributed Systems for Decentralization - The Beginning
- Lecture 9 - The Evolution of Cryptocurrencies
- Lecture 10 - Open Consensus and Bitcoin
- Lecture 11 - Bitcoin Mining and Beyond
- Lecture 12 - Smart Contracts and the Permissioned Models of Blockchain
- Lecture 13 - Blockchain Elements - I
- Lecture 14 - Blockchain Elements - II
- Lecture 15 - Blockchain Elements - III
- Lecture 16 - Blockchain Elements - IV
- Lecture 17 - Blockchain Elements - V
- Lecture 18 - Permissionless Model and Open Consensus
- Lecture 19 - Nakamoto Consensus (Proof of Work)
- Lecture 20 - Limitations of PoW: Forking and Security
- Lecture 21 - Beyond PoW
- Lecture 22 - Ethereum 1
- Lecture 23 - Ethereum 2
- Lecture 24 - Ethereum 3
- Lecture 25 - Ethereum 4
- Lecture 26 - Consensus for Permissioned Models
- Lecture 27 - State Machine Replication as Distributed Consensus
- Lecture 28 - Paxos
- Lecture 29 - Paxos - Safety and Liveness

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Byzantine Faults
- Lecture 31 - Byzantine Agreement Protocols
- Lecture 32 - Safety and Liveness of PBFT
- Lecture 33 - Enterprise Blockchains
- Lecture 34 - Hyperledger Fabric 1
- Lecture 35 - Hyperledger Fabric 2
- Lecture 36 - Hyperledger Fabric 3
- Lecture 37 - Hyperledger Fabric 4
- Lecture 38 - Consensus Scalability
- Lecture 39 - Bitcoin-NG
- Lecture 40 - Collective Signing (CoSi)
- Lecture 41 - ByzCoin
- Lecture 42 - Algorand
- Lecture 43 - Identity Management - I
- Lecture 44 - Identity Management - II
- Lecture 45 - Identity Management - III
- Lecture 46 - Blockchain Interoperability - I
- Lecture 47 - Blockchain Interoperability - II
- Lecture 48 - Blockchain Interoperability - III
- Lecture 49 - Hyperledger Indy - I
- Lecture 50 - Hyperledger Indy - II
- Lecture 51 - Hyperledger Aries
- Lecture 52 - Blockchain Security - I
- Lecture 53 - Blockchain Security - II
- Lecture 54 - Blockchain Security - III
- Lecture 55 - Use Cases
- Lecture 56 - A Potential Use Case From a Critics Perspective
- Lecture 57 - Blockchain in Financial Services
- Lecture 58 - Public Sector Use Cases
- Lecture 59 - Blockchain for Decentralized Marketplace - Part 1
- Lecture 60 - Blockchain for Decentralized Marketplace - Part 2

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Algorithmic Game Theory

Subject Co-ordinator - Prof. Palash Dey

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Assumptions of Game Theory
- Lecture 3 - Examples of Games
- Lecture 4 - Equilibrium Concepts
- Lecture 5 - Nash Equilibrium
- Lecture 6 - Indifference Principle
- Lecture 7 - Security of Players
- Lecture 8 - Minmax Theorem
- Lecture 9 - Implications of Minmax Theorem
- Lecture 10 - MSNEs of Matrix Games
- Lecture 11 - Iterative Eliminations of Dominated Strategies
- Lecture 12 - Iterative Eliminations of Dominated Strategies (Continued...)
- Lecture 13 - Braess's paradox
- Lecture 14 - Yao's Lemma and its applications
- Lecture 15 - Support Enumeration Algorithm
- Lecture 16 - Succinct game
- Lecture 17 - Potential Games
- Lecture 18 - Best Response Dynamics
- Lecture 19 - Fast Convergence of Best Response Dynamics
- Lecture 20 - Computing  $\epsilon$ -PSNE for Network Congestion Games
- Lecture 21 - PSNE for Congestion Games
- Lecture 22 - PSNE for Symmetric Congestion Games
- Lecture 23 - Functional NP
- Lecture 24 - PPAD Class
- Lecture 25 - Sperner's Lemma
- Lecture 26 - Approximate MSNE Computation
- Lecture 27 - Correlated Equilibrium
- Lecture 28 - Coarse Correlated Equilibrium
- Lecture 29 - External Regret Framework

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- Lecture 30 - Multiplicative Weight Algorithm
- Lecture 31 - Multiplicative Weight Algorithm (Continued....)
- Lecture 32 - Swap Regret and Correlated Equilibrium
- Lecture 33 - Swap Regret to External Regret Reduction
- Lecture 34 - Braess's paradox and Pigou's Network
- Lecture 35 - PoA of Selfish Routing Game
- Lecture 36 - PoA of Selfish Load Balancing Game
- Lecture 37 - Bayesian Game
- Lecture 38 - BNE of First Price Auction
- Lecture 39 - Extensive Form Game
- Lecture 40 - Mechanism Design Introduction
- Lecture 41 - Implementation of Social Choice Functions
- Lecture 42 - Revelation Principle
- Lecture 43 - Properties of Social Choice Function
- Lecture 44 - Gibbard-Satterthwaite Theorem
- Lecture 45 - Quasilinear Environment
- Lecture 46 - Ex-Post Efficiency
- Lecture 47 - VCG Mechanism
- Lecture 48 - Example of VCG Mechanism
- Lecture 49 - Weighted VCG
- Lecture 50 - Affine Maximizer
- Lecture 51 - Recap of Topics Discussed so Far
- Lecture 52 - Single Parameter Domain
- Lecture 53 - DSIC in Single Parameter Domain
- Lecture 54 - Myerson's Lemma
- Lecture 55 - Sponsored Search Auction
- Lecture 56 - Intermediate Domain
- Lecture 57 - Algorithmic Mechanism Design
- Lecture 58 - Stable Matching
- Lecture 59 - Gale-Shapley Algorithm
- Lecture 60 - Properties of Stable Matching

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Machine Learning for Earth System Sciences

Subject Co-ordinator - Prof. Adway Mitra

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Basics of Spatio-Temporal Modeling
- Lecture 3 - Geostatistical Equation for Spatio-Temporal Process
- Lecture 4 - Gaussian Process Regression and Inverse Problems
- Lecture 5 - Anomaly Event Detection
- Lecture 6 - Extreme Events
- Lecture 7 - Extreme Value Theory
- Lecture 8 - Causality
- Lecture 9 - Networks
- Lecture 10 - Data Assimilation
- Lecture 11 - Challenges and Opportunities for ML in ESS
- Lecture 12 - Types of Machine Learning Problems in ESS
- Lecture 13 - Convolutional Networks for Spatial Problems
- Lecture 14 - Sequential Models for Temporal Problems
- Lecture 15 - Probabilistic Models for Earth System Science
- Lecture 16 - Identification of Indian Monsoon Predictors
- Lecture 17 - Statistical Downscaling of Rainfall with Machine Learning
- Lecture 18 - Detection of Anomaly and Extreme Events
- Lecture 19 - Identifying Causal Relations from Time-Series - 1
- Lecture 20 - Identifying Causal Relations from Time-Series - 2
- Lecture 21 - Spatio-Temporal Modelling of Extremes
- Lecture 22 - Hierarchical Bayesian Models for Spatio-Temporal Processes
- Lecture 23 - Geostatistical modelling for mapping based on in-situ measurements
- Lecture 24 - Nowcasting of Extreme Weather Events
- Lecture 25 - Discovering Clustered Weather Patterns
- Lecture 26 - Interpretable Machine Learning for Earth System Science
- Lecture 27 - Object Detection in Satellite Imagery - 1
- Lecture 28 - Object Detection in Satellite Imagery - 2
- Lecture 29 - Image Fusion from Multiple Sources for Remote Sensing

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Image Segmentation for Remote Sensing
- Lecture 31 - Satellite Imagery as a Proxy for Geophysical Measurements
- Lecture 32 - Precipitation Nowcasting from Remote Sensing
- Lecture 33 - Deep Domain Adaptation for Remote Sensing
- Lecture 34 - Introduction to Earth System Modelling
- Lecture 35 - Stochastic Weather Generator
- Lecture 36 - Physics-Inspired Machine Learning for Process Models - 1
- Lecture 37 - Physics-Inspired Machine Learning for Process Models - 2
- Lecture 38 - Parameterizations for Sub-Grid Processes Using ML
- Lecture 39 - Data Assimilation for Earth System Model Correction
- Lecture 40 - ML for Climate Change Projection and Course Conclusion

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Statistical Learning for Reliability Analysis

Subject Co-ordinator - Prof. Monalisa Sarma

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Reliability Engineering
- Lecture 2 - Introduction to Statistical Methods in Reliability
- Lecture 3 - Concept of Probability and Probability Theory
- Lecture 4 - Tutorial on Introduction to RE, SL and Probability Theory - Part I
- Lecture 5 - Conditional, Total and Reverse Probability
- Lecture 6 - Tutorial on Conditional Probability and Total Probability
- Lecture 7 - Introduction to Probability Distributions
- Lecture 8 - Introduction to Probability Distributions (Continued...)
- Lecture 9 - Discrete Probability Distribution - Part 1
- Lecture 10 - Discrete Probability Distribution - Part 2
- Lecture 11 - Tutorial on Discrete Probability Distributions
- Lecture 12 - Continuous Probability Distributions - Part 1
- Lecture 13 - Continuous Probability Distributions - Part 2
- Lecture 14 - Tutorial on Continuous Probability Distribution Functions - Part 1
- Lecture 15 - Tutorial on Continuous Probability Distribution Functions - Part 2
- Lecture 16 - Sampling Distributions - Part 1
- Lecture 17 - Sampling Distributions - Part 2
- Lecture 18 - Sampling Distributions - Part 3
- Lecture 19 - Sampling Distributions - Part 4
- Lecture 20 - Sampling Distributions - Part 5
- Lecture 21 - Tutorial on Sampling Distributions
- Lecture 22 - Statistical Inference - Part 1
- Lecture 23 - Statistical Inference - Part 2
- Lecture 24 - Statistical Inference - Part 3
- Lecture 25 - Tutorial on Statistical Inference
- Lecture 26 - Statistical Inference - Part 4
- Lecture 27 - Statistical Inference - Part 5
- Lecture 28 - Tutorial on Confidence Interval
- Lecture 29 - Statistical Inference - Part 6

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- Lecture 30 - Statistical Inference - Part 7
- Lecture 31 - Statistical Inference - Part 8
- Lecture 32 - ANOVA - I
- Lecture 33 - ANOVA - II
- Lecture 34 - ANOVA - III
- Lecture 35 - ANOVA - IV
- Lecture 36 - ANOVA - V
- Lecture 37 - ANOVA - VI
- Lecture 38 - Correlation Analysis - Part I
- Lecture 39 - Correlation Analysis - Part II
- Lecture 40 - Regression Analysis - Part I
- Lecture 41 - Regression Analysis - Part II
- Lecture 42 - Regression Analysis - Part III
- Lecture 43 - Tutorial on Relation Analysis
- Lecture 44 - Auto-Regression Analysis
- Lecture 45 - Logistic Regression - Part I
- Lecture 46 - Logistic Regression - Part II
- Lecture 47 - Logistic Regression - Part III
- Lecture 48 - Tutorial on Logistic Regression
- Lecture 49 - Introduction
- Lecture 50 - Bayesian Classification - Part I
- Lecture 51 - Bayesian Classification - Part II
- Lecture 52 - k-Nearest Neighbor Classification
- Lecture 53 - Tutorial on Classification Techniques
- Lecture 54 - Support Vector Machine - Part I
- Lecture 55 - Support Vector Machine - Part II
- Lecture 56 - Support Vector Machine - Part III
- Lecture 57 - Support Vector Machine - Part IV
- Lecture 58 - Support Vector Machine - Part V
- Lecture 59 - Support Vector Machine - Part VI
- Lecture 60 - Tutorial on SVM

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Foundations of Cyber Physical Systems

Subject Co-ordinator - Prof. Soumyajit Dey

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - CPS: Motivational examples and compute platforms
- Lecture 2 - CPS: Motivational examples and compute platforms (Continued...)
- Lecture 3 - CPS: Motivational examples and compute platforms (Continued...)
- Lecture 4 - CPS: Motivational examples and compute platforms (Continued...)
- Lecture 5 - CPS: Motivational examples and compute platforms (Continued...)
- Lecture 6 - Real time sensing and communication for CPS
- Lecture 7 - Real time sensing and communication for CPS (Continued...)
- Lecture 8 - Real time sensing and communication for CPS (Continued...)
- Lecture 9 - Real time sensing and communication for CPS (Continued...)
- Lecture 10 - Real time task scheduling for CPS
- Lecture 11 - Real time task scheduling for CPS (Continued...)
- Lecture 12 - Real time task scheduling for CPS (Continued...)
- Lecture 13 - Real time task scheduling for CPS (Continued...)
- Lecture 14 - Real time task scheduling for CPS (Continued...)
- Lecture 15 - Real time task scheduling for CPS (Continued...)
- Lecture 16 - Real time task scheduling for CPS (Continued...)
- Lecture 17 - Real time task scheduling for CPS (Continued...)
- Lecture 18 - Dynamical system modeling, stability, controller design
- Lecture 19 - Dynamical system modeling, stability, controller design (Continued...)
- Lecture 20 - Dynamical system modeling, stability, controller design (Continued...)
- Lecture 21 - Dynamical system modeling, stability, controller design (Continued...)
- Lecture 22 - Dynamical system modeling, stability, controller design (Continued...)
- Lecture 23 - Dynamical system modeling, stability, controller design (Continued...)
- Lecture 24 - Delay-aware Design; Platform effect on Stability/Performance
- Lecture 25 - Delay-aware Design; Platform effect on Stability/Performance (Continued...)
- Lecture 26 - Delay-aware Design; Platform effect on Stability/Performance (Continued...)
- Lecture 27 - Delay-aware Design; Platform effect on Stability/Performance (Continued...) Corrigendum
- Lecture 28 - Hybrid Automata based modelling of CPS
- Lecture 29 - Hybrid Automata based modelling of CPS (Continued...)

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- Lecture 30 - Hybrid Automata based modelling of CPS (Continued...)
- Lecture 31 - Hybrid Automata based modelling of CPS (Continued...)
- Lecture 32 - Hybrid Automata based modelling of CPS (Continued...)
- Lecture 33 - Reachability analysis
- Lecture 34 - Reachability analysis (Continued...)
- Lecture 35 - Reachability analysis (Continued...)
- Lecture 36 - Reachability analysis (Continued...)
- Lecture 37 - Lyapunov Stability, Barrier Functions
- Lecture 38 - Lyapunov Stability, Barrier Functions (Continued...)
- Lecture 39 - Lyapunov Stability, Barrier Functions (Continued...)
- Lecture 40 - Lyapunov Stability, Barrier Functions (Continued...)
- Lecture 41 - Lyapunov Stability, Barrier Functions (Continued...)
- Lecture 42 - Lyapunov Stability, Barrier Functions (Continued...)
- Lecture 43 - Quadratic Program based safe Controller Design
- Lecture 44 - Quadratic Program based safe Controller Design (Continued...)
- Lecture 45 - Quadratic Program based safe Controller Design (Continued...)
- Lecture 46 - Quadratic Program based safe Controller Design (Continued...)
- Lecture 47 - Neural Network (NN) Based controllers in CPS
- Lecture 48 - Neural Network (NN) Based controllers in CPS (Continued...)
- Lecture 49 - Neural Network (NN) Based controllers in CPS (Continued...)
- Lecture 50 - State Estimation using Kalman Filters (KF)
- Lecture 51 - State Estimation using Kalman Filters (KF) (Continued...)
- Lecture 52 - Attack Detection and Mitigation in CPS
- Lecture 53 - Attack Detection and Mitigation in CPS (Continued...)
- Lecture 54 - Attack Detection and Mitigation in CPS (Continued...)
- Lecture 55 - Attack Detection and Mitigation in CPS (Continued...)
- Lecture 56 - Attack Detection and Mitigation in CPS (Continued...)
- Lecture 57 - Attack Detection and Mitigation in CPS (Continued...)
- Lecture 58 - Attack Detection and Mitigation in CPS (Continued...)
- Lecture 59 - Attack Detection and Mitigation in CPS (Continued...)

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Selected Topics in Algorithms

Subject Co-ordinator - Prof. Palash Dey

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Maximum Flow
- Lecture 2 - Ford - Fulkerson Method
- Lecture 3 - Edmond - Karp Algorithm
- Lecture 4 - Edmond - Karp Algorithm (Continued...)
- Lecture 5 - Flow Decomposition
- Lecture 6 - Maximum Bipartite Matching, Fattest Augmenting Path
- Lecture 7 - Karger's Algorithm
- Lecture 8 - Augmenting Path
- Lecture 9 - Edmonds Blossom Algorithm
- Lecture 10 - Edmond - Karp Algorithm (Continued...)
- Lecture 11 - Introduction to Randomized Algorithm
- Lecture 12 - Polynomial Identity Testing
- Lecture 13 - Perfect Bipartite Matching, Randomized Quicksort
- Lecture 14 - Concentration Inequalities: Markov, Chebyshev, Chernoff
- Lecture 15 - Proof of Chernoff Bound
- Lecture 16 - Coupon Collector Problem
- Lecture 17 - Balls and Bins
- Lecture 18 - Balls and Bins (Continued...)
- Lecture 19 - Two Point Sampling
- Lecture 20 - Randomized Algorithm for 2 SAT
- Lecture 21 - Markov Chain, Periodicity, Stationary Distribution
- Lecture 22 - Mixing Time, Reversible Markov Chain
- Lecture 23 - Metropolis Algorithm, Markov Chain on Independent Sets
- Lecture 24 - Random Walk on Cycles
- Lecture 25 - Shuffling Cards
- Lecture 26 - Monte Carlo Method, Hitting Time, Cover Time
- Lecture 27 - DNF Counting
- Lecture 28 - DNF Counting (Continued...)
- Lecture 29 - Counting Independent Sets of a Graph

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Counting Independent Sets of a Graph (Continued...)
- Lecture 31 - Introduction of NP, co-NP, and P
- Lecture 32 - Turing Reduction, Karp Reduction
- Lecture 33 - NP - Completeness of 3SAT
- Lecture 34 - NP - Completeness of Independent Set
- Lecture 35 - NP - Completeness of vertex cover and clique
- Lecture 36 - NP - Completeness of 3-coloring
- Lecture 37 - NP - Completeness of Subset sum and Knapsack
- Lecture 38 - NP - Completeness of set cover, Weak and Strong NP - completeness
- Lecture 39 - Self Reduction
- Lecture 40 - Randomized Approximation Algorithm
- Lecture 41 - Derandomization
- Lecture 42 - Travelling Salesman Problem
- Lecture 43 - 2-Factor Approximation Algorithm for Metric TSP
- Lecture 44 - 1.5-Factor Approximation Algorithm for Metric TSP
- Lecture 45 - Approximation Algorithm for Set Cover
- Lecture 46 - FPTAS for Knapsack
- Lecture 47 - Introduction to Linear Program
- Lecture 48 - Introduction to Linear Program (Continued...)
- Lecture 49 - Dual Fitting
- Lecture 50 - Dual Fitting (Continued...)
- Lecture 51 - Dual Fitting
- Lecture 52 - Set Cover using LP rounding
- Lecture 53 - Vertex Cover using reduction to set cover
- Lecture 54 - Vertex Cover LP
- Lecture 55 - Randomized Rounding
- Lecture 56 - Primal Dual Scheme
- Lecture 57 - Introduction to Parameterized Algorithm
- Lecture 58 - Faster FPT Algorithm for Vertex Cover
- Lecture 59 - Introduction to Kernelization
- Lecture 60 - Linear Programming Based Kernels

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Foundations and Applications of Machine Learning

Subject Co-ordinator - Prof. Adway Mitra

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - AI/ML
- Lecture 2 - AI/ML
- Lecture 3 - Supervised and Unsupervised Learning
- Lecture 4 - ML Model Algorithm/04
- Lecture 5 - AI/ML problem
- Lecture 6 - K-nearest-neighbor classification/regression/K-
- Lecture 7 - Accuracy, Precision, Recall, Confusion
- Lecture 8 - Discriminative Feature Selection
- Lecture 9 - Decision Tree Algorithm/
- Lecture 10 - Classifier
- Lecture 11 - Probability Theory
- Lecture 12 - Bayesian Naïve Bayes Classifier
- Lecture 13 - Linear Algebra
- Lecture 14 - Linear Classifiers
- Lecture 15 - Multi-class Linear Classifier
- Lecture 16 - Optimization
- Lecture 17 - Linear Regularized Regression
- Lecture 18 - Max-margin Linear Classification/
- Lecture 19 - Basic Neural Networks
- Lecture 20 - Neural Network
- Lecture 21 - Overfitting and Underfitting
- Lecture 22 - Boosting/
- Lecture 23 - Data (dimensionality)
- Lecture 24 - Supervised Learning
- Lecture 25 - Hierarchical Clustering/
- Lecture 26 - K-means Clustering/ K-
- Lecture 27 - Evaluation of Clustering/
- Lecture 28 - Mean-shift
- Lecture 29 - DB-Scan

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Graph-based Clustering
- Lecture 31 - Time-series
- Lecture 32 - Recommendation Systems
- Lecture 33 - Image Classification
- Lecture 34 - Neural Features for Images
- Lecture 35 - Data Mining
- Lecture 36 - Sequential Neural Models and Natural Language Processing
- Lecture 37 - Generative Models, Reinforcement Learning
- Lecture 38 - Transfer Learning and Domain Adaptation
- Lecture 39 - Deep Learning
- Lecture 40 - Machine Learning for Climate Sciences

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Artificial Intelligence for Economics

Subject Co-ordinator - Prof. Dripto Bakshi, Prof. Adway Mitra, Prof. Palash Dey

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Network Data - Some Stories !!
- Lecture 2 - The Stable Matching Algorithm
- Lecture 3 - Uncertainty in Financial Markets : Idea of Hedging
- Lecture 4 - Uncertainty in Financial Markets : Idea of Hedging (Continued...)
- Lecture 5 - Uncertainty in Financial Markets : Idea of Hedging (Continued...)
- Lecture 6 - Unconstrained Optimization
- Lecture 7 - Constrained Optimization
- Lecture 8 - Heuristic Search Techniques
- Lecture 9 - Multi-objective Heuristic Search and Game Trees
- Lecture 10 - Clustering and Segmentation
- Lecture 11 - Decision Tree and Random Forest
- Lecture 12 - Linear Regression and Classifiers
- Lecture 13 - Uncertainty Modeling
- Lecture 14 - Neural Networks
- Lecture 15 - Deep Learning for Time Series Forecasting
- Lecture 16 - Causality in Time-Series
- Lecture 17 - Interventional Causality and Attribution
- Lecture 18 - Game Theory
- Lecture 19 - Game Theory (Continued...)
- Lecture 20 - Game Theory (Continued...) Games with Incomplete Information
- Lecture 21 - Game Theory (Continued...) Games with Incomplete Information (Continued...)
- Lecture 22 - Game Theory - Sequential Games
- Lecture 23 - Game Theory - Rubenstein Bargaining
- Lecture 24 - Network Economics
- Lecture 25 - Network Economics (Continued...)
- Lecture 26 - Introduction to Auction Theory
- Lecture 27 - Second Price Auction
- Lecture 28 - First Price Auction
- Lecture 29 - Overview of Mechanism Design

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Groves Mechanism
- Lecture 31 - VCG Mechanism
- Lecture 32 - Single Parameter Domain and Myerson Lemma
- Lecture 33 - Sponsored Search Auction
- Lecture 34 - Single Peaked Domain and Median Voting
- Lecture 35 - Dimensionality Reduction (Principal Component Analysis) â The Math Prerequisites
- Lecture 36 - Dimensionality Reduction (Principal Component Analysis) â The Technique
- Lecture 37 - Agent-based Modeling for Economics
- Lecture 38 - Computer Vision for Economics
- Lecture 39 - Text Mining and NLP for Economics
- Lecture 40 - Bias, Fairness, Ethics and Interpretability in AI

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Approximation Algorithm

Subject Co-ordinator - Prof. Palash Dey

Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Overview of NP-completeness and How to Tackle It
- Lecture 2 - Deterministic Rounding of Linear Program: An Approximation Algorithm for Weighted
- Lecture 3 - Overview of LP Duality and Complementary Slackness
- Lecture 4 - Dual Rounding: An Approximation Algorithm for Weighted Set Cover
- Lecture 5 - Primal dual method for Weighted Set Cover
- Lecture 6 - Greedy algorithm for Weighted Set Cover
- Lecture 7 - Dual Fitting Analysis of Greedy Set Cover
- Lecture 8 - Randomized Rounding Algorithm for Weighted Set Cover
- Lecture 9 - Scheduling Jobs with Deadlines and Release Dates on a Single Machine
- Lecture 10 - The k-Center Problem
- Lecture 11 - Local Search Algorithm for Scheduling Jobs on Multiple Identical Machines
- Lecture 12 - Greedy Algorithm for Scheduling Jobs on Multiple Identical Machines
- Lecture 13 - Inapproximability of the Traveling Salesman problem
- Lecture 14 - 2-Approximation Algorithm for Metric TSP
- Lecture 15 - 1.5-Approximation Algorithm for Metric TSP
- Lecture 16 - Edge Coloring
- Lecture 17 - Pseudo Polynomial Time Algorithm for Knapsack
- Lecture 18 - FPTAS for Knapsack
- Lecture 19 - PTAS for Minimizing Makespan for Scheduling Jobs on Constant Number of Machines
- Lecture 20 - PTAS for Minimizing Makespan for Scheduling Jobs on Parallel Identical Machines
- Lecture 21 - PTAS for Minimizing Makespan for Scheduling Jobs on Parallel Identical Machines (Continued...)
- Lecture 22 - An APTAS for Bin Packing
- Lecture 23 - An APTAS for Bin Packing (Continued...)
- Lecture 24 - 2 Factor Approximation Algorithm for Scheduling Unweighted Jobs on a Single Machine
- Lecture 25 - 3 Factor Approximation Algorithm for Scheduling Weighted Jobs on a Single Machine
- Lecture 26 - A Polynomial Time Separation Oracle for Scheduling Weighted Jobs on a Single Machine
- Lecture 27 - 3 Factor Approximation Algorithm for Prize Collecting Steiner Tree
- Lecture 28 - 3 Factor Approximation Algorithm for Prize Collecting Steiner Tree (Continued...)
- Lecture 29 - A 4 Factor Approximation Algorithm for Uncapacitated Facility Location Problem

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - A 4 Factor Approximation Algorithm for Uncapacitated Facility Location Problem (Continued...)
- Lecture 31 - A 4 Factor Approximation Algorithm for Uncapacitated Facility Location Problem (Continued...)
- Lecture 32 - Randomized  $1/2$  Factor Approximation Algorithm for MAX-SAT and MAX-CUT
- Lecture 33 - Derandomization using Method of Conditional Expectation
- Lecture 34 - Flipping Biased Coin for Better Than  $.5$  Approximation Algorithm for Max-SAT
- Lecture 35 - Randomized Rounding Based  $(1-1/e)$  Factor Approximation Algorithm for Max-SAT
- Lecture 36 - Best of Two Solutions for Max-SAT
- Lecture 37 - Nonlinear Rounding for Max-SAT
- Lecture 38 - Randomized Rounding for Prize Collecting Steiner Tree
- Lecture 39 - Randomized Rounding for Prize Collecting Steiner Tree (Continued...)
- Lecture 40 - Randomized Rounding for Uncapacitated Facility Location
- Lecture 41 - Chernoff Bound
- Lecture 42 - Chernoff Bound (Continued...)
- Lecture 43 - Integer Multicommodity Flow
- Lecture 44 - Primal-dual Algorithm for Minimum Weighted Feedback Vertex Set
- Lecture 45 - Primal-dual Algorithm for Minimum Weighted Feedback Vertex Set (Continued...)
- Lecture 46 - Primal-dual Algorithm for Minimum Weighted Feedback Vertex Set (Continued...)
- Lecture 47 - Primal-dual Algorithm for Steiner Forest
- Lecture 48 - Primal-dual Algorithm for Steiner Forest (Continued...)
- Lecture 49 - Primal-dual Algorithm for Steiner Forest (Continued...)
- Lecture 50 -  $2$ -Approximation Algorithm for Multiway Cut
- Lecture 51 -  $3/2$ -Approximation Algorithm for Multiway Cut
- Lecture 52 -  $3/2$ -Approximation Algorithm for Multiway Cut (Continued...)
- Lecture 53 - Approximation Algorithm for Multicut
- Lecture 54 - Approximation Algorithm for Multicut (Continued...)
- Lecture 55 - Approximation Algorithm for Multicut (Continued...)
- Lecture 56 - Introduction to Semidefinite Program
- Lecture 57 - SDP Based Approximation Algorithm for Max Cut
- Lecture 58 - SDP Based Approximation Algorithm for Max Cut (Continued...)
- Lecture 59 - Inapproximability of Scheduling Jobs on Multiple Non-identical Machines
- Lecture 60 - Inapproximability of Edge Disjoint Path

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Pattern Recognition

Subject Co-ordinator - Prof. Sukhendu Das, Prof. C.A. Murthy

Co-ordinating Institute - IIT - Madras | Indian Statistical Institute

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Principles of Pattern Recognition I (Introduction and Uses)
- Lecture 2 - Principles of Pattern Recognition II (Mathematics)
- Lecture 3 - Principles of Pattern Recognition III (Classification and Bayes Decision Rule)
- Lecture 4 - Clustering vs. Classification
- Lecture 5 - Relevant Basics of Linear Algebra, Vector Spaces
- Lecture 6 - Eigen Value and Eigen Vectors
- Lecture 7 - Vector Spaces
- Lecture 8 - Rank of Matrix and SVD
- Lecture 9 - Types of Errors
- Lecture 10 - Examples of Bayes Decision Rule
- Lecture 11 - Normal Distribution and Parameter Estimation
- Lecture 12 - Training Set, Test Set
- Lecture 13 - Standardization, Normalization, Clustering and Metric Space
- Lecture 14 - Normal Distribution and Decision Boundaries I
- Lecture 15 - Normal Distribution and Decision Boundaries II
- Lecture 16 - Bayes Theorem
- Lecture 17 - Linear Discriminant Function and Perceptron
- Lecture 18 - Perceptron Learning and Decision Boundaries
- Lecture 19 - Linear and Non-Linear Decision Boundaries
- Lecture 20 - K-NN Classifier
- Lecture 21 - Principal Component Analysis (PCA)
- Lecture 22 - Fisher's LDA
- Lecture 23 - Gaussian Mixture Model (GMM)
- Lecture 24 - Assignments
- Lecture 25 - Basics of Clustering, Similarity/Dissimilarity Measures, Clustering Criteria.
- Lecture 26 - K-Means Algorithm and Hierarchical Clustering
- Lecture 27 - K-Medoids and DBSCAN
- Lecture 28 - Feature Selection
- Lecture 29 - Feature Selection

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Feature Selection
- Lecture 31 - Cauchy Schwartz Inequality
- Lecture 32 - Feature Selection Criteria Function
- Lecture 33 - Feature Selection Criteria Function
- Lecture 34 - Principal Components
- Lecture 35 - Comparison Between Performance of Classifiers
- Lecture 36 - Basics of Statistics, Covariance, and their Properties
- Lecture 37 - Data Condensation, Feature Clustering, Data Visualization
- Lecture 38 - Probability Density Estimation
- Lecture 39 - Visualization and Aggregation
- Lecture 40 - Support Vector Machine (SVM)
- Lecture 41 - FCM and Soft-Computing Techniques
- Lecture 42 - Examples of Uses or Application of Pattern Recognition; And When to do clustering
- Lecture 43 - Examples of Real-Life Dataset

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Performance Evaluation of Computer Systems

Subject Co-ordinator - Prof. Krishna Moorthy Sivalingam

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to performance evaluation of computer systems
- Lecture 2 - How to avoid common mistakes
- Lecture 3 - Selection of techniques and metrics
- Lecture 4 - Case study
- Lecture 5 - Random Variables and probability distributions
- Lecture 6 - Probability distributions - I
- Lecture 7 - Probability distributions - II
- Lecture 8 - Probability distributions - III
- Lecture 9 - Stochastic process
- Lecture 10 - Markov Chain
- Lecture 11 - Slotted Aloha protocol model and discrete-time birth death process
- Lecture 12 - Continuous time Markov chain and queuing theory - I
- Lecture 13 - Queuing theory - I (Continued)
- Lecture 14 - Queuing theory - II
- Lecture 15 - Queuing theory - III
- Lecture 16 - Queuing theory - IV
- Lecture 17 - Queuing theory - V
- Lecture 18 - Queuing theory - VI
- Lecture 19 - Queuing networks - I
- Lecture 20 - Queuing networks - II
- Lecture 21 - Slotted Aloha Markov model
- Lecture 22 - Simulations - I
- Lecture 23 - Simulations - II
- Lecture 24 - Simulations - III
- Lecture 25 - Operational laws - I
- Lecture 26 - Operational laws - II
- Lecture 27 - Open and closed queuing networks
- Lecture 28 - Approximate MVA
- Lecture 29 - Convolution algorithm - I

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Convolution algorithm - II
- Lecture 31 - Load-dependent service centers
- Lecture 32 - Hierarchical decomposition
- Lecture 33 - Balanced Job Bounds
- Lecture 34 - Confidence interval for proportions and introduction to experimental design
- Lecture 35 - 2k factorial design
- Lecture 36 - 2k r factorial design and 2k-p fractional factorial design
- Lecture 37 - Programming aspects of discrete-event simulations - I
- Lecture 38 - Programming aspects of discrete-event simulations - II
- Lecture 39 - Discrete-event simulations - III
- Lecture 40 - PetriNets - I
- Lecture 41 - PetriNets - II
- Lecture 42 - PetriNets - III

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Theory of Automata, Formal Languages and Computation

Subject Co-ordinator - Prof. Kamala Krithivasan

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Grammars and Natural Language Processing
- Lecture 2 - Grammars and Languages Generated
- Lecture 3 - Grammars and Languages Generated (Continued.)
- Lecture 4 - Ambiguity in CFG
- Lecture 5 - Simplification of CFG
- Lecture 6 - Removal of Unit Productions, Chomsky Normal Form for CFG
- Lecture 7 - Greibach Normal Form for CFG
- Lecture 8 - Final State Automata
- Lecture 9 - Non Deterministic FSA
- Lecture 10 - Non Deterministic FSA (Continued.)
- Lecture 11 - Non Deterministic FSA with E(Epsilon)- Moves
- Lecture 12 - Equivalence Between FSA and Type 3 Grammars
- Lecture 13 - Regular Expressions, Regular Expressions to NFSA
- Lecture 14 - DFSA to Regular Expressions
- Lecture 15 - Problems and Solutions - I
- Lecture 16 - Pumping Lemmas for Regular Sets and CFL
- Lecture 17 - MYHILL - Nerode Theorem
- Lecture 18 - Minimization of DFSA
- Lecture 19 - FSA with output Moore and Mealy Machines
- Lecture 20 - Pushdown Automata
- Lecture 21 - Pushdown Automata, Equivalence Between Acceptance by Empty Store and Acceptance by Final State
- Lecture 22 - Pushdown Automata CFG to PDA
- Lecture 23 - Pushdown Automata PDA to CFG
- Lecture 24 - Problems and Solutions - II
- Lecture 25 - Problems and Solutions - III
- Lecture 26 - Turing Machines
- Lecture 27 - Turing Machines (Continued.)
- Lecture 28 - Turing Machine as Acceptor, Techniques for TM Construction
- Lecture 29 - Generalized Versions of Turing Machines

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Turing Machine as a Generating Device
- Lecture 31 - Recursive Sets, Recursively Innumerable Sets, Encoding of TM, Halting Problem
- Lecture 32 - Problems and Instances, Universal TM, Decidability
- Lecture 33 - RICE'S Theorem, Linear Bounded Automata, Properties of TM
- Lecture 34 - POST'S Correspondence Problems
- Lecture 35 - POST'S Correspondence Problems (Continued.), Time and Tape Complexity of TM
- Lecture 36 - NP - Complete Problems, Cook's Theorem
- Lecture 37 - NP - Complete Problems (Continued.)
- Lecture 38 - Regulated Rewriting
- Lecture 39 - L-Systems
- Lecture 40 - Grammar Systems
- Lecture 41 - DNA Computing
- Lecture 42 - Membrane Computing

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Computer Graphics

Subject Co-ordinator - Prof. Sukhendu Das

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - CRT Display Devices
- Lecture 3 - CRT Display Devices (Continued...)
- Lecture 4 - CRT Display Devices (Continued...)
- Lecture 5 - CRT Display Devices (Continued...)
- Lecture 6 - Transformations in 2D
- Lecture 7 - Transformations in 2D (Continued...)
- Lecture 8 - Three Dimensional Graphics
- Lecture 9 - Three Dimensional Graphics (Continued...)
- Lecture 10 - Three Dimensional Graphics (Continued...)
- Lecture 11 - Projection Transformations And Viewing Pipeline
- Lecture 12 - 3D Viewing - Projection Transformations And Viewing Pipeline
- Lecture 13 - Scan Converting Lines, Circles And Ellipses
- Lecture 14 - Scan Converting Lines, Circles And Ellipses (Continued...)
- Lecture 15 - Scan Converting Lines, Circles And Ellipses (Continued...)
- Lecture 16 - Scan Converting Lines, Circles And Ellipses (Continued...)
- Lecture 17 - Scan Converting Lines, Circles And Ellipses (Continued...)
- Lecture 18 - Polyfill- Scan Conversion Of A Polygon
- Lecture 19 - Scan Conversion Of A Polygon (Continued...)
- Lecture 20 - Clipping - Lines And Polygons
- Lecture 21 - Clipping Lines And Polygons
- Lecture 22 - Clipping Lines
- Lecture 23 - Solid Modelling
- Lecture 24 - Solid Modelling
- Lecture 25 - Solid Modelling (Continued...)
- Lecture 26 - Visible Surface Detection
- Lecture 27 - Visible Surface Detection (Continued...)
- Lecture 28 - Visible Surface Detection (Continued...)
- Lecture 29 - Visible Surface Detection (Continued...)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Visible Surface Detection (Continued...)
- Lecture 31 - Visible Surface Detection (Continued...)
- Lecture 32 - Visible Surface Detection (Continued...)
- Lecture 33 - Illumination And Shading
- Lecture 34 - Illumination And Shading (Continued...)
- Lecture 35 - Illumination And Shading (Continued...)
- Lecture 36 - Curve Representation
- Lecture 37 - Curve Representation (Continued...)
- Lecture 38 - Curves And Surface Representation
- Lecture 39 - Graphics Programming Using Open GL
- Lecture 40 - Graphics Programming Using Open GL (Continued...)
- Lecture 41 - Advanced Topics
- Lecture 42 - Digital Image Processing Image Compression-Jpeg-Enhancements
- Lecture 43 - Digital Image Processing (Continued...)

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Computer Organization

Subject Co-ordinator - Prof. S. Raman

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction To Computing  
Lecture 2 - Introduction To System  
Lecture 3 - Introduction To System  
Lecture 4 - Processor Activities  
Lecture 5 - Processor As a State Machine  
Lecture 6 - Data Path Architecture  
Lecture 7 - Data Path Controller  
Lecture 8 - State Machine Design  
Lecture 9 - Controller Design  
Lecture 10 - Controller Design (Contd)  
Lecture 11 - Typical Micro Instructions  
Lecture 12 - Addressing Modes  
Lecture 13 - Problem Exercise  
Lecture 14 - Problem Exercise  
Lecture 15 - Introduction to memory system  
Lecture 16 - CPU - Memory Interaction  
Lecture 17 - Cache Organization  
Lecture 18 - Cache Organization  
Lecture 19 - Virtual Memory  
Lecture 20 - Virtual Memory  
Lecture 21 - Performance Calculation  
Lecture 22 - Segmentation  
Lecture 23 - Address Translation and Protection  
Lecture 24 - Programmed I/O  
Lecture 25 - Interrupt Driven I/O  
Lecture 26 - DMA  
Lecture 27 - Device Service Routines  
Lecture 28 - Evolution Of I/O  
Lecture 29 - I/O Devices

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - I/O Devices - Contd
- Lecture 31 - Buses
- Lecture 32 - Buses Contd
- Lecture 33 - Conclusion

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Database Design

Subject Co-ordinator - Dr. S. Srikanth, Prof. D. Janaki Ram

Co-ordinating Institute - IIT - Madras | IIIT - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Database Management System  
Lecture 2 - Conceptual Designs  
Lecture 3 - Conceptual Designs  
Lecture 4 - Relational Model  
Lecture 5 - Relational Model  
Lecture 6 - Structured Query Language - I  
Lecture 7 - Structured Query Language - II  
Lecture 8 - ER Model to Relational Mapping  
Lecture 9 - Functional Dependencies and Normal Form  
Lecture 10 - ER Model to Relational Model Mapping  
Lecture 11 - Storage Structures  
Lecture 12 - Indexing Techniques Single Level  
Lecture 13 - Indexing Techniques Multi Level  
Lecture 14 - Constraints and Triggers  
Lecture 15 - Query Processing and Optimization  
Lecture 16 - Query Processing and Optimization - II  
Lecture 17 - Query Processing and Optimization - III  
Lecture 18 - Transaction Processing Concepts  
Lecture 19 - Transaction Processing and Database Manager  
Lecture 20 - Foundation for Concurrency Control  
Lecture 21 - Concurrency Control Part - 1  
Lecture 22 - Concurrency Control Part - 2  
Lecture 23 - Concurrency Control Part - 3  
Lecture 24 - Concurrency Control Part - 4  
Lecture 25 - Distributed Transaction Models  
Lecture 26 - Basic 2-Phase and 3-phase commit protocol  
Lecture 27 - Concurrency Control for Distributed Transaction  
Lecture 28 - Introduction to Transaction Recovery  
Lecture 29 - Recovery Mechanisms - II

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Recovery Mechanisms - III
- Lecture 31 - Introduction to Data Warehousing and OLAP
- Lecture 32 - Introduction to Data Warehousing and OLAP
- Lecture 33 - Case Study
- Lecture 34 - Case Study ORACLE and Microsoft Access
- Lecture 35 - Data Mining and Knowledge Discovery
- Lecture 36 - Data Mining and Knowledge Discovery Part - II
- Lecture 37 - Object Oriented Databases
- Lecture 38 - Object Oriented Databases - II
- Lecture 39 - XML - Introductory Concepts
- Lecture 40 - XML - Advanced Concepts
- Lecture 41 - XML - Databases
- Lecture 42 - Case Study - Part One - Database Design
- Lecture 43 - Case Study - Part Two - Database Design

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Discrete Mathematical Structures

Subject Co-ordinator - Prof. Kamala Krithivasan

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Propositional Logic  
Lecture 2 - Propositional Logic (Continued)  
Lecture 3 - Predicates & Quantifiers  
Lecture 4 - Predicates & Quantifiers (Continued)  
Lecture 5 - Logical Inference  
Lecture 6 - Resolution Principles & Application to PROLOG  
Lecture 7 - Methods of Proof  
Lecture 8 - Normal Forms  
Lecture 9 - Proving Programs Correct (Continued)  
Lecture 10 - Sets  
Lecture 11 - Induction  
Lecture 12 - Set Operations On Strings  
Lecture 13 - Relations  
Lecture 14 - Graphs  
Lecture 15 - Graphs (Continued)  
Lecture 16 - Trees  
Lecture 17 - Trees And Graphs  
Lecture 18 - Special Properties Of Relations  
Lecture 19 - Closure Of Relations  
Lecture 20 - Closure Properties Of Relations  
Lecture 21 - Order Relations  
Lecture 22 - Order Relations And Equivalence Relations  
Lecture 23 - Equivalence Relations And Partitions  
Lecture 24 - Functions  
Lecture 25 - Functions (Continued)  
Lecture 26 - Functions (Continued)  
Lecture 27 - Pigeonhole Principle  
Lecture 28 - Permutations And Combinations  
Lecture 29 - Permutations And Combinations (Continued)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Generating Functions
- Lecture 31 - Generating Functions (Continued)
- Lecture 32 - Recurrence Relations
- Lecture 33 - Recurrence Relations (Continued)
- Lecture 34 - Recurrence Relations (Continued)
- Lecture 35 - Algebras
- Lecture 36 - Algebras (Continued)
- Lecture 37 - Algebras (Continued)
- Lecture 38 - Finite State Automaton
- Lecture 39 - Finite State Automaton (Continued)
- Lecture 40 - Lattices

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Artificial Intelligence (Prof. Deepak Khemani)

Subject Co-ordinator - Prof. Deepak Khemani

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Artificial Intelligence  
Lecture 2 - Introduction to AI  
Lecture 3 - AI Introduction  
Lecture 4 - AI Introduction  
Lecture 5 - Introduction  
Lecture 6 - State Space Search - Introduction  
Lecture 7 - Search - DFS and BFS  
Lecture 8 - Search DFID  
Lecture 9 - Heuristic Search  
Lecture 10 - Hill Climbing  
Lecture 11 - Solution Space Search, Beam Search  
Lecture 12 - TSP Greedy Methods  
Lecture 13 - Tabu Search  
Lecture 14 - Optimization - I (Simulated Annealing)  
Lecture 15 - Optimization - II (Genetic Algorithms)  
Lecture 16 - Population based methods for Optimization  
Lecture 17 - Population Based Methods II  
Lecture 18 - Branch and Bound, Dijkstra's Algorithm  
Lecture 19 - A\* Algorithm  
Lecture 20 - Admissibility of A\*  
Lecture 21 - A\* Monotone Property, Iterative Deeping A\*  
Lecture 22 - Recursive Best First Search, Sequence Allignment  
Lecture 23 - Pruning the Open and Closed lists  
Lecture 24 - Problem Decomposition with Goal Trees  
Lecture 25 - AO\* Algorithm  
Lecture 26 - Game Playing  
Lecture 27 - Game Playing - Minimax Search  
Lecture 28 - Game Playing - AlphaBeta  
Lecture 29 - Game Playing - SSS \*

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Rule Based Systems
- Lecture 31 - Inference Engines
- Lecture 32 - Rete Algorithm
- Lecture 33 - Planning
- Lecture 34 - Planning FSSP, BSSP
- Lecture 35 - Goal Stack Planning. Sussman's Anomaly
- Lecture 36 - Non-linear planning
- Lecture 37 - Plan Space Planning
- Lecture 38 - GraphPlan
- Lecture 39 - Constraint Satisfaction Problems
- Lecture 40 - CSP continued
- Lecture 41 - Knowledge-based systems
- Lecture 42 - Knowledge-based Systems, PL
- Lecture 43 - Propositional Logic
- Lecture 44 - Resolution Refutation for PL
- Lecture 45 - First-order Logic (FOL)
- Lecture 46 - Reasoning in FOL
- Lecture 47 - Backward chaining
- Lecture 48 - Resolution for FOL

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Programming, Data Structures and Algorithms

Subject Co-ordinator - Prof. Hema A Murthy, Prof. Shankar Balachandran, Dr. N.S. Narayanaswamy

Co-ordinating Institute - IIT - Madras

- Lecture 1 - Introduction to Computers and Programming
- Lecture 2 - Writing your first program
- Lecture 3 - Variables, Operators and Expressions
- Lecture 4 - Variable declarations, more operators and precedence
- Lecture 5 - Input and Output Statements
- Lecture 6 - Conditionals
- Lecture 7 - Loops
- Lecture 8 - Video Solution to Digital Root Programming Assignment
- Lecture 9 - Introduction to arrays
- Lecture 10 - Working with 1D arrays
- Lecture 11 - Find prime numbers
- Lecture 12 - Debugging demo
- Lecture 13 - Multi-dimensional arrays
- Lecture 14 - Pointers
- Lecture 15 - More on pointers
- Lecture 16 - Arrays and pointer arithmetic
- Lecture 17 - Introduction to Strings
- Lecture 18 - More on Strings
- Lecture 19 - Video Solution to Print Elements of a Matrix in Spiral Order Programming Assignment
- Lecture 20 - Introduction to functions
- Lecture 21 - More details on functions
- Lecture 22 - Arguments, variables and parameters
- Lecture 23 - Pass parameters by reference
- Lecture 24 - Recursive functions
- Lecture 25 - Running time of a program
- Lecture 26 - Computing time complexity
- Lecture 27 - Video Solution to Palindrome Checker Programming Assignment
- Lecture 28 - Algorithms and Powering
- Lecture 29 - Polynomial evaluation and multiplication
- Lecture 30 - Linear and Binary Search Analysis
- Lecture 31 - Analysis of minimum and maximum in an array
- Lecture 32 - Sorting I
- Lecture 33 - Sorting II

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 34 - Finding i-th smallest number
- Lecture 35 - Video Solution to Sorting words Programming Assignment
- Lecture 36 - Structures
- Lecture 37 - More on structures
- Lecture 38 - Using structures and pointers to structures
- Lecture 39 - Dynamic memory allocation
- Lecture 40 - Linked Lists
- Lecture 41 - Brief introduction to C++
- Lecture 42 - Data Structures
- Lecture 43 - Lists
- Lecture 44 - Supplementary Lesson
- Lecture 45 - Video Solution to Implementing a Hash Table ADT Programming Assignment
- Lecture 46 - Stacks
- Lecture 47 - Queues
- Lecture 48 - Trees
- Lecture 49 - Tree traversal
- Lecture 50 - Binary Search Trees
- Lecture 51 - Heaps
- Lecture 52 - Graphs and Representation
- Lecture 53 - Supplementary Lesson
- Lecture 54 - Video Solution to the Queue in a Hospital Programming Assignment
- Lecture 55 - Greedy Algorithms
- Lecture 56 - Dynamic Programming
- Lecture 57 - Matrix Chain Multiplication
- Lecture 58 - Dijkstra's Algorithm
- Lecture 59 - Boyer-Moore String Matching Algorithm
- Lecture 60 - File I/O
- Lecture 61 - Modular Programming

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Information Security I

Subject Co-ordinator - Prof. V. Kamakoti

Co-ordinating Institute - IIT - Madras

Lecture 1 - Module 1 - Part 0 - Introduction to the Course  
Lecture 2 - Module 1 - Part 1 - Definition of Information Security  
Lecture 3 - Module 1 - Part 2 - Information Security Terminologies  
Lecture 4 - Module 1 - Part 3 - Goals of Information Security  
Lecture 5 - Module 1 - Part 4 - Implementation Issues of the Goals of Information Security - I  
Lecture 6 - Module 1 - Part 5 - Implementation Issues of the Goals of Information Security - II  
Lecture 7 - Module 1 - Part 6 - Control Mechanisms for Information Security - I  
Lecture 8 - Module 1 - Part 7 - Access Control - Administrative and Technical  
Lecture 9 - Module 1 - Part 8 - Passwords - Are they secure? - I  
Lecture 10 - Module 1 - Part 9 - Access Control - Administrative and Technical  
Lecture 11 - Module 1 - Part 10 - Passwords - Are they secure? - III  
Lecture 12 - Module 1 - Part 11 - Multifactor Authentication - Challenges  
Lecture 13 - Module 1 - Part 12 - Application Level Control and Information Security Planning  
Lecture 14 - Module 1 - Part 13 - Information Security - Policy, Standard and Practice  
Lecture 15 - Module 1 - Part 14 - Policies governing Issues, Roles and Responsibilities  
Lecture 16 - Module 1 - Part 15 - Managing changes in Information Security Policies  
Lecture 17 - Module 1 - Part 16 - Spheres of Information Security  
Lecture 18 - Module 2 - Part 1 - Protecting your Personal Computer - I  
Lecture 19 - Module 2 - part 2 - Protecting your Personal Computer - II  
Lecture 20 - Module 2 - Part 3 - Protecting your Personal Computer - III  
Lecture 21 - Module 2 - Part 4 - Cloud Computing (Basic Definitions) - I  
Lecture 22 - Module 2 - Part 5 - Cloud Computing (Deployment) - II  
Lecture 23 - Module 2 - Part 6 - Cloud Computing (Security Issues) - III  
Lecture 24 - Module 2 - Part 7 - Cloud Computing (Trust and Risk) - IV  
Lecture 25 - Module 2 - Part 8 - Cloud Computing (Security and Privacy Issues) - V  
Lecture 26 - Module 2 - Part 9 - Cloud Computing (Security and Privacy Issues) - VI  
Lecture 27 - Module 2 - Part 10 - Cloud Computing (Application and Data level security) - VII  
Lecture 28 - Module 2 - Part 11 - Cloud Computing (Summary) - VIII  
Lecture 29 - Module 2 - Part 12 - Standard I  
Lecture 30 - Module 2 - Part 13 - Standard II  
Lecture 31 - Module 2 - Part 14 - Standard III  
Lecture 32 - Module 3 - Part 1  
Lecture 33 - Module 3 - Part 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 34 - Module 3 - Part 3  
Lecture 35 - Module 3 - Part 4  
Lecture 36 - Module 3 - Part 5  
Lecture 37 - Module 3 - Part 6  
Lecture 38 - Module 3 - Part 7  
Lecture 39 - Module 3 - Part 8  
Lecture 40 - Module 3 - Part 9  
Lecture 41 - Module 4 - Part 1  
Lecture 42 - module 4 - Part 2  
Lecture 43 - Module 4 - Part 3  
Lecture 44 - Module 4 - Part 4  
Lecture 45 - Module 4 - Part 5  
Lecture 46 - Module 4 - Part 6  
Lecture 47 - Module 4 - Part 7  
Lecture 48 - Module 4 - Part 8  
Lecture 49 - Module 4 - Part 9  
Lecture 50 - Module 4 - Part 10  
Lecture 51 - Module 5 - Part 1  
Lecture 52 - Module 5 - Part 2  
Lecture 53 - Module 5 - Part 3  
Lecture 54 - Module 5 - Part 4  
Lecture 55 - Module 5 - Part 5  
Lecture 56 - Module 5 - Part 6  
Lecture 57 - Module 5 - Part 7  
Lecture 58 - Module 6 - Part 1  
Lecture 59 - Module 6 - Part 2  
Lecture 60 - Module 6 - Part 3  
Lecture 61 - Module 6 - Part 4  
Lecture 62 - Module 6 - Part 5  
Lecture 63 - Module 6 - Part 6  
Lecture 64 - Module 6 - Part 7  
Lecture 65 - Module 6 - Part 8

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Programming and Data structures (PDS)

Subject Co-ordinator - Dr. N S. Narayanaswamy

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - A Simple C Program for Sorting
- Lecture 2 - Review of Structures, Pointers, and Functions
- Lecture 3 - Recursion
- Lecture 4 - Abstract Data Types-Data + Methods
- Lecture 5 - List Data Type
- Lecture 6 - Access and update methods
- Lecture 7 - Doubly Linked List Data Type
- Lecture 8 - Doubly Linked Lists and Arrays
- Lecture 9 - ADT Stacks
- Lecture 10 - Checking of Balanced Parenthesis
- Lecture 11 - Infix and Postfix expressions and Expression evaluation
- Lecture 12 - Queue ADT Definition and Implementation
- Lecture 13 - Merging using Queue ADT and Queue types
- Lecture 14 - Tree ADT and Traversals
- Lecture 15 - Binary Tree ADT and traversals
- Lecture 16 - Tree Applications
- Lecture 17 - Binary Search Trees
- Lecture 18 - Heaps

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Design and Analysis of Algorithms

Subject Co-ordinator - Prof. Madhavan Mukund

Co-ordinating Institute - Chennai Mathematical Institute

- Lecture 1 - Course Outline
- Lecture 2 - Example
- Lecture 3 - Example
- Lecture 4 - Example
- Lecture 5 - Introduction and motivation
- Lecture 6 - Input size, worst case, average case
- Lecture 7 - Quantifying efficiency
- Lecture 8 - Examples
- Lecture 9 - Arrays and lists
- Lecture 10 - Searching in an array
- Lecture 11 - Selection Sort
- Lecture 12 - Insertion sort
- Lecture 13 - Merge sort
- Lecture 14 - Merge sort - analysis
- Lecture 15 - Quicksort
- Lecture 16 - Quicksort - analysis
- Lecture 17 - Sorting - Concluding remarks
- Lecture 18 - Introduction to graphs
- Lecture 19 - Representing graphs
- Lecture 20 - Breadth first search (BFS)
- Lecture 21 - Depth first search (DFS)
- Lecture 22 - Applications of BFS and DFS
- Lecture 23 - Directed acyclic graphs
- Lecture 24 - Directed acyclic graphs
- Lecture 25 - Single source shortest paths
- Lecture 26 - Dijkstras algorithm
- Lecture 27 - Negative edge weights
- Lecture 28 - All pairs shortest paths
- Lecture 29 - Minimum Cost Spanning Trees
- Lecture 30 - Prims Algorithm
- Lecture 31 - Kruskals algorithm
- Lecture 32 - Union-Find using arrays
- Lecture 33 - Union-Find using pointers

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 34 - Priority queues
- Lecture 35 - Heaps
- Lecture 36 - Heaps
- Lecture 37 - Counting inversions
- Lecture 38 - Closest pair of points
- Lecture 39 - Binary Search Trees
- Lecture 40 - Balanced search trees
- Lecture 41 - Interval scheduling
- Lecture 42 - Scheduling with deadlines
- Lecture 43 - Huffman codes
- Lecture 44 - Introduction to dynamic programming
- Lecture 45 - Memoization
- Lecture 46 - Grid Paths
- Lecture 47 - Common subwords and subsequences
- Lecture 48 - Edit distance
- Lecture 49 - Matrix multiplication
- Lecture 50 - Linear Programming
- Lecture 51 - LP modelling
- Lecture 52 - LP modelling
- Lecture 53 - Network Flows
- Lecture 54 - Reductions
- Lecture 55 - Checking Algorithms
- Lecture 56 - P and NP

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Programming, Data Structures and Algorithms (Arithmetic)

Subject Co-ordinator - Dr. N S. Narayanaswamy, Prof. Shankar Balachandran, Prof. Hema A Murthy

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Computers and Programming
- Lecture 2 - Writing your first program
- Lecture 3 - Variables, Operators and Expressions
- Lecture 4 - Variable declarations, more operators and precedence
- Lecture 5 - Input and Output Statements
- Lecture 6 - Conditionals
- Lecture 7 - Loops
- Lecture 8 - Introduction to arrays
- Lecture 9 - Working with 1D arrays
- Lecture 10 - Find prime numbers
- Lecture 11 - Debugging demo
- Lecture 12 - Multi-dimensional arrays
- Lecture 13 - Pointers
- Lecture 14 - More on pointers
- Lecture 15 - Arrays and pointer arithmetic
- Lecture 16 - Introduction to Strings
- Lecture 17 - More on Strings
- Lecture 18 - Introduction to functions
- Lecture 19 - More details on functions
- Lecture 20 - Arguments, variables and parameters
- Lecture 21 - Pass parameters by reference
- Lecture 22 - Recursive Functions
- Lecture 23 - C control structures, functional specification of programs
- Lecture 24 - Complexity Analysis using Sum and Product Rule
- Lecture 25 - Complexity Analysis of Recursive Functions
- Lecture 26 - Algorithms and Powering
- Lecture 27 - Polynomial evaluation and multiplication
- Lecture 28 - Linear and Binary Search Analysis
- Lecture 29 - Analysis of minimum and maximum in an array

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Sorting I: Insertion, Merge
- Lecture 31 - Sorting II: Counting, Radix
- Lecture 32 - Finding i-th smallest number
- Lecture 33 - Structures
- Lecture 34 - More on Structures
- Lecture 35 - Using structures and pointers to structures
- Lecture 36 - Dynamic memory allocation
- Lecture 37 - Linked List
- Lecture 38 - Brief introduction to C++: Classes and objects
- Lecture 39 - Abstract Data Types
- Lecture 40 - More on ADT
- Lecture 41 - Stacks: Last In First Out
- Lecture 42 - Queues: First In First
- Lecture 43 - Trees
- Lecture 44 - Tree Traversal
- Lecture 45 - Binary Search
- Lecture 46 - Heaps
- Lecture 47 - Graphs and Representations
- Lecture 48 - Greedy Algorithms
- Lecture 49 - Dynamic Programming
- Lecture 50 - Matrix Chain Multiplication
- Lecture 51 - Hash Tables
- Lecture 52 - Graph Algorithms: Dijkstras Algorithm and Prims Algorithm
- Lecture 53 - Graph Traversals: BFS,DFS and Articulation Points
- Lecture 54 - File I/O
- Lecture 55 - Modular Programming



# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computer Architecture

Subject Co-ordinator - Prof.Madhu Mutyam

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Computer Architecture  
Lecture 2 - Quantitative Principles of Computer Design  
Lecture 3 - Instruction Set Principles-Part 1  
Lecture 4 - Instruction Set Principles-Part 2  
Lecture 5 - Instruction Set Principles-Part 3  
Lecture 6 - Cache Memory Hierarchy - Part 1  
Lecture 7 - Cache Memory Hierarchy - Part 2  
Lecture 8 - Cache Memory Hierarchy - Part 3  
Lecture 9 - Cache Memory Hierarchy - Part 4  
Lecture 10 - Main Memory Design - Part 1  
Lecture 11 - Main Memory Design - Part 2  
Lecture 12 - Main Memory Design - Part 3  
Lecture 13 - Fundamentals of Pipelining - Part 1  
Lecture 14 - Fundamentals of Pipelining - Part 2  
Lecture 15 - Fundamentals of Pipelining - Part 3  
Lecture 16 - Fundamentals of Pipelining - Part 4  
Lecture 17 - Fundamentals of Pipelining - Part 5  
Lecture 18 - Scalar to Superscalar pipeline  
Lecture 19 - Instruction Dependencies  
Lecture 20 - Compiler optimizations for Exposing ILP  
Lecture 21 - Advanced Branch Prediction Techniques - Part 1  
Lecture 22 - Advanced Branch Prediction Techniques - Part 2  
Lecture 23 - Superscalar Organization  
Lecture 24 - Register Renaming  
Lecture 25 - Tomasulo Algorithm  
Lecture 26 - Dynamic Execution Core  
Lecture 27 - Multi threading  
Lecture 28 - Multicore Processor Architecture  
Lecture 29 - Cache Coherence

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Cache Coherence Protocol Design
- Lecture 31 - Synchronization
- Lecture 32 - Memory Consistency - Part 1
- Lecture 33 - Memory Consistency - Part 2

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Model Checking

Subject Co-ordinator - Prof. B. Srivathsan

Co-ordinating Institute - Chennai Mathematical Institute

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Course Overview  
Lecture 2 - Module 1 - Modeling code behaviour  
Lecture 3 - Module 2 - Modeling hardware circuits  
Lecture 4 - Module 3 - Modeling data-dependent programs  
Lecture 5 - Module 4 - Modeling concurrent systems  
Lecture 6 - Summary  
Lecture 7 - Module 1 - Model checking tools  
Lecture 8 - Module 2 - Simple models in NuSMV  
Lecture 9 - Module 3 - Hardware verification using NuSMV  
Lecture 10 - Module 4 - Modeling concurrent systems in NuSMV  
Lecture 11 - Summary.  
Lecture 12 - Module 1 - A problem in concurrency  
Lecture 13 - Module 2 - What is a property?  
Lecture 14 - Module 3 - Invariants  
Lecture 15 - Module 4 - Safety properties  
Lecture 16 - Module 5 - Liveness properties  
Lecture 17 - Summary..  
Lecture 18 - Module 1 - Road map  
Lecture 19 - Module 2 - A gentle introduction to automata  
Lecture 20 - Module 3 - Simple properties of finite automata  
Lecture 21 - Module 4 - Safety properties described by automata  
Lecture 22 - Summary...  
Lecture 23 - Module 1 - Specifying properties  
Lecture 24 - Module 2 - Omega-regular expressions  
Lecture 25 - Module 3 - Bchi automata  
Lecture 26 - Module 4 - Simple properties of Bchi automata  
Lecture 27 - Summary....  
Lecture 28 - Module 1 - Overview  
Lecture 29 - Module 2 - Omega-regular expressions to NBA

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Module 3 - Checking emptiness of NBA
- Lecture 31 - Module 4 - Generalized NBA
- Lecture 32 - Summary.....
- Lecture 33 - Module 1 - Introduction to LTL
- Lecture 34 - Module 2 - Semantics of LTL
- Lecture 35 - Module 3 - A puzzle
- Lecture 36 - Summary.
- Lecture 37 - Module 1 - Automata based LTL model-checking
- Lecture 38 - Module 2 - LTL to NBA
- Lecture 39 - Module 3 - Automaton construction
- Lecture 40 - Summary..
- Lecture 41 - Module 1 - Tree view of a transition system
- Lecture 42 - Module 2 - CTL\*
- Lecture 43 - Module 3 - CTL
- Lecture 44 - summary...
- Lecture 45 - Module 1 - Adequate CTL formulae
- Lecture 46 - Module 2 - EX, EU, EG
- Lecture 47 - Module 3 - Final algorithm
- Lecture 48 - Module 4 - State-space explosion
- Lecture 49 - Summary....
- Lecture 50 - Module 1 - Introduction to BDDs
- Lecture 51 - Module 2 - Ordered BDDs
- Lecture 52 - Module 3 - Representing transition systems as OBDDs
- Lecture 53 - Summary.....
- Lecture 54 - Timed transition systems
- Lecture 55 - Concluding remarks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Functional Programming in Haskell

Subject Co-ordinator - Prof. Madhavan Mukund, Prof. S P Suresh

Co-ordinating Institute - Chennai Mathematical Institute

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Functions  
Lecture 2 - Types  
Lecture 3 - Haskell  
Lecture 4 - Running Haskell programs  
Lecture 5 - Currying  
Lecture 6 - Examples  
Lecture 7 - Lists  
Lecture 8 - Functions on lists  
Lecture 9 - Characters and strings  
Lecture 10 - Tuples  
Lecture 11 - Computation as rewriting  
Lecture 12 - Polymorphism and higher-order functions  
Lecture 13 - Map and filter  
Lecture 14 - List comprehension  
Lecture 15 - Folding through a list  
Lecture 16 - Measuring efficiency  
Lecture 17 - Sorting  
Lecture 18 - Using infinite lists  
Lecture 19 - Conditional polymorphism  
Lecture 20 - Defining functions in ghci  
Lecture 21 - User-defined datatypes  
Lecture 22 - Abstract datatypes  
Lecture 23 - Modules  
Lecture 24 - Recursive data types  
Lecture 25 - Binary search trees  
Lecture 26 - Balanced search trees  
Lecture 27 - Arrays  
Lecture 28 - Input/Output

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# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Virtual Reality

Subject Co-ordinator - Prof. Steven LaVall

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Course mechanics
- Lecture 2 - Goals and VR definitions
- Lecture 3 - Historical perspective
- Lecture 4 - Birds-eye view (general)
- Lecture 5 - Birds-eye view (general) (Continued...)
- Lecture 6 - Birds-eye view (hardware)
- Lecture 7 - Birds-eye view (software)
- Lecture 8 - Birds-eye view (sensation and perception)
- Lecture 9 - Geometric modeling
- Lecture 10 - Transforming models
- Lecture 11 - Matrix algebra and 2D rotations
- Lecture 12 - 3D rotations and yaw, pitch, and roll
- Lecture 13 - 3D rotations and yaw, pitch, and roll (Continued...)
- Lecture 14 - Axis-angle representations
- Lecture 15 - Quaternions
- Lecture 16 - Converting and multiplying rotations
- Lecture 17 - Converting and multiplying rotations (Continued...)
- Lecture 18 - Homogeneous transforms
- Lecture 19 - The chain of viewing transforms
- Lecture 20 - Eye transforms
- Lecture 21 - Eye transforms (Continued...)
- Lecture 22 - Canonical view transform
- Lecture 23 - Viewport transform
- Lecture 24 - Viewport transform (Continued...)
- Lecture 25 - Three interpretations of light
- Lecture 26 - Refraction
- Lecture 27 - Simple lenses
- Lecture 28 - Diopters
- Lecture 29 - Imaging properties of lenses

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- Lecture 30 - Lens aberrations
- Lecture 31 - Optical system of eyes
- Lecture 32 - Photoreceptors
- Lecture 33 - Sufficient resolution for VR
- Lecture 34 - Light intensity
- Lecture 35 - Eye movements
- Lecture 36 - Eye movements (Continued...)
- Lecture 37 - Eye movement issues for VR
- Lecture 38 - Neuroscience of vision
- Lecture 39 - Depth perception
- Lecture 40 - Depth perception (Continued...)
- Lecture 41 - Motion perception
- Lecture 42 - Frame rates and displays
- Lecture 43 - Frame rates and displays (Continued...)
- Lecture 44 - Overview
- Lecture 45 - Orientation tracking
- Lecture 46 - Tilt drift correction
- Lecture 47 - Yaw drift correction
- Lecture 48 - Tracking with a camera
- Lecture 49 - Perspective n-point problem
- Lecture 50 - Filtering
- Lecture 51 - Lighthouse approach
- Lecture 52 - Visual Rendering-Overview
- Lecture 53 - Visual Rendering-overview (Continued...)
- Lecture 54 - Shading models
- Lecture 55 - Rasterization
- Lecture 56 - Pixel shading
- Lecture 57 - VR-specific problems
- Lecture 58 - Distortion shading
- Lecture 59 - Post-rendering image warp
- Lecture 60 - Physics and physiology
- Lecture 61 - Auditory perception
- Lecture 62 - Auditory localization
- Lecture 63 - Rendering
- Lecture 64 - Spatialization and display
- Lecture 65 - Combining other senses
- Lecture 66 - Interfaces -overview
- Lecture 67 - Locomotion
- Lecture 68 - Manipulation

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - System control
- Lecture 70 - Social interaction
- Lecture 71 - Evaluation of VR Systems



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Machine Learning (Sponsored by AICTE)

Subject Co-ordinator - Dr. Balaraman Ravindran

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - A brief introduction to machine learning  
Lecture 2 - Supervised Learning  
Lecture 3 - Unsupervised Learning  
Lecture 4 - Reinforcement Learning  
Lecture 5 - Probability Basics - 1  
Lecture 6 - Probability Basics - 2  
Lecture 7 - Linear Algebra - 1  
Lecture 8 - Linear Algebra - 2  
Lecture 9 - Statistical Decision Theory - Regression  
Lecture 10 - Statistical Decision Theory - Classification  
Lecture 11 - Bias-Variance  
Lecture 12 - Linear Regression  
Lecture 13 - Multivariate Regression  
Lecture 14 - Subset Selection 1  
Lecture 15 - Subset Selection 2  
Lecture 16 - Shrinkage Methods  
Lecture 17 - Principal Components Regression  
Lecture 18 - Partial Least Squares  
Lecture 19 - Linear Classification  
Lecture 20 - Logistic Regression  
Lecture 21 - Linear Discriminant Analysis 1  
Lecture 22 - Linear Discriminant Analysis 2  
Lecture 23 - Linear Discriminant Analysis 3  
Lecture 24 - Optimization  
Lecture 25 - Perceptron Learning  
Lecture 26 - SVM - Formulation  
Lecture 27 - SVM - Interpretation & Analysis  
Lecture 28 - SVMs for Linearly Non Separable Data  
Lecture 29 - SVM Kernels

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - SVM - Hinge Loss Formulation
- Lecture 31 - Weka Tutorial
- Lecture 32 - Early Models
- Lecture 33 - Backpropogation - I
- Lecture 34 - Backpropogation - II
- Lecture 35 - Initialization, Training and Validation
- Lecture 36 - Maximum Likelihood Estimate
- Lecture 37 - Priors and MAP Estimate
- Lecture 38 - Bayesian Parameter Estimation
- Lecture 39 - Introduction
- Lecture 40 - Regression Trees
- Lecture 41 - Stopping Criteria and Pruning
- Lecture 42 - Loss Functions for Classification
- Lecture 43 - Categorical Attributes
- Lecture 44 - Multiway Splits
- Lecture 45 - Missing Values, Imputation and Surrogate Splits
- Lecture 46 - Instability, Smoothness and Repeated Subtrees
- Lecture 47 - Tutorial
- Lecture 48 - Evaluation Measures I
- Lecture 49 - Bootstrapping and Cross Validation
- Lecture 50 - 2 Class Evaluation Measures
- Lecture 51 - The ROC Curve
- Lecture 52 - Minimum Description Length and Exploratory Analysis
- Lecture 53 - Introduction to Hypothesis Testing
- Lecture 54 - Basic Concepts
- Lecture 55 - Sampling Distributions and the Z Test
- Lecture 56 - Student's t-test
- Lecture 57 - The Two Sample and Paired Sample t-tests
- Lecture 58 - Confidence Intervals
- Lecture 59 - Bagging, Committee Machines and Stacking
- Lecture 60 - Boosting
- Lecture 61 - Gradient Boosting
- Lecture 62 - Random Forest
- Lecture 63 - Naive Bayes
- Lecture 64 - Bayesian Networks
- Lecture 65 - Undirected Graphical Models - Introduction
- Lecture 66 - Undirected Graphical Models - Potential Functions
- Lecture 67 - Hidden Markov Models
- Lecture 68 - Variable Elimination

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Belief Propagation
- Lecture 70 - Partitional Clustering
- Lecture 71 - Hierarchical Clustering
- Lecture 72 - Threshold Graphs
- Lecture 73 - The BIRCH Algorithm
- Lecture 74 - The CURE Algorithm
- Lecture 75 - Density Based Clustering
- Lecture 76 - Gaussian Mixture Models
- Lecture 77 - Expectation Maximization
- Lecture 78 - Expectation Maximization (Continued...)
- Lecture 79 - Spectral Clustering
- Lecture 80 - Learning Theory
- Lecture 81 - Frequent Itemset Mining
- Lecture 82 - The Apriori Property
- Lecture 83 - Introduction to Reinforcement Learning
- Lecture 84 - RL Framework and TD Learning
- Lecture 85 - Solution Methods and Applications
- Lecture 86 - Multi-class Classification

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Artificial Intelligence: Knowledge Representation

Subject Co-ordinator - Prof. Deepak Khemani

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Abductive Inferences and Expectations
- Lecture 3 - On Machine Learning
- Lecture 4 - A New Test of Intelligence?
- Lecture 5 - The World According to Us
- Lecture 6 - From Particles to Concepts
- Lecture 7 - The Domains for Reasoning
- Lecture 8 - Hierarchies in Representation
- Lecture 9 - Logic and Representation: A Quick Tour
- Lecture 10 - Symbols and Thought
- Lecture 11 - From Gears to Symbols
- Lecture 12 - Truth, Logic, and Provability
- Lecture 13 - A Syntactic Machine
- Lecture 14 - Entailment and Proof
- Lecture 15 - The Languages of Logic
- Lecture 16 - Patterns in Arguments
- Lecture 17 - Rules of Inference
- Lecture 18 - Propositional Logic
- Lecture 19 - Propositional Logic: Syntax
- Lecture 20 - Propositional Logic: Semantics
- Lecture 21 - Proofs: Natural Deduction
- Lecture 22 - The Deduction Theorem
- Lecture 23 - Models
- Lecture 24 - The Tableau Method
- Lecture 25 - First Order Logic
- Lecture 26 - First Order Logic: Syntax
- Lecture 27 - FOL: Universal Instantiation
- Lecture 28 - First Order Logic: Semantics
- Lecture 29 - FOL: Truth Assignments

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Modified Modus Ponens
- Lecture 31 - The Unification Algorithm
- Lecture 32 - Skolemization
- Lecture 33 - Expert Systems
- Lecture 34 - Backward Chaining Systems
- Lecture 35 - Deductive Retrieval
- Lecture 36 - The Resolution Refutation Method
- Lecture 37 - Clause Form in FOL
- Lecture 38 - Resolution Refutation in FOL
- Lecture 39 - First Order Logic with Equality
- Lecture 40 - Who was the surgeon?
- Lecture 41 - Consistency vs. Completeness
- Lecture 42 - Logic Programming
- Lecture 43 - Arithmetic
- Lecture 44 - Horn Clauses and Prolog
- Lecture 45 - SLD Derivation = Backward Chaining
- Lecture 46 - Programming in Logic
- Lecture 47 - Prolog: Programming in Logic
- Lecture 48 - Prolog: Procedural Interpretation
- Lecture 49 - Prolog: Query Evaluation
- Lecture 50 - Prolog: Unifying Terms
- Lecture 51 - Prolog: Goal Order
- Lecture 52 - Prolog: Tabling
- Lecture 53 - Prolog: Negation by Failure
- Lecture 54 - Prolog: The Cut Operator
- Lecture 55 - Rule Based Expert Systems
- Lecture 56 - The OPS5 Language
- Lecture 57 - Match, Resolve, Execute
- Lecture 58 - Conflict Resolution Strategies
- Lecture 59 - The Rete Algorithm
- Lecture 60 - The Rete Net
- Lecture 61 - The Rete Net : Examples
- Lecture 62 - Knowledge Representation
- Lecture 63 - Synonyms, Antonyms, Hyponyms, Meronyms
- Lecture 64 - Binary Relations
- Lecture 65 - Describing Family Relations
- Lecture 66 - Recursive Descriptions
- Lecture 67 - Abstract Entities
- Lecture 68 - Reification: Units of Measurement

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Semantic Nets and Knowledge Graphs
- Lecture 70 - DL: Description Logics
- Lecture 71 - Defining New Concepts and Roles
- Lecture 72 - The Sentences in DL
- Lecture 73 - A Family of Logics
- Lecture 74 - DL: Some Examples
- Lecture 75 - ALC Tableau
- Lecture 76 - Model Checking in ALC
- Lecture 77 - ALC Tableau: Examples
- Lecture 78 - Language Independent Representation
- Lecture 79 - Conceptual Dependency Theory
- Lecture 80 - CD States
- Lecture 81 - Inferences in MARGIE
- Lecture 82 - CD: Actions
- Lecture 83 - English to CD
- Lecture 84 - Representing Complex Verbs
- Lecture 85 - Semantic Parsing of Language
- Lecture 86 - Knowledge Structures
- Lecture 87 - Scripts
- Lecture 88 - SAM: Script Applier Mechanism
- Lecture 89 - A VIP Visit
- Lecture 90 - Invoking Scripts
- Lecture 91 - Goals, Plans, and Actions
- Lecture 92 - Goal Interactions
- Lecture 93 - Explanation Driven Understanding
- Lecture 94 - Tussle Over a Bicycle
- Lecture 95 - Plan Applier Mechanism (PAM)
- Lecture 96 - Requests and Rule Instances
- Lecture 97 - Managing Rule Instances
- Lecture 98 - Knowledge Structures: Frames
- Lecture 99 - Inheritance
- Lecture 100 - A Frame System for Travel Planning
- Lecture 101 - Inheritance in Taxonomies
- Lecture 102 - Default Reasoning
- Lecture 103 - Closed World Assumption
- Lecture 104 - Circumscription
- Lecture 105 - Default Logic
- Lecture 106 - Autoepistemic Reasoning
- Lecture 107 - The Event Calculus

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 108 - The Effects of Events
- Lecture 109 - Epistemic Logic
- Lecture 110 - Kripke Structures: Possible Worlds Semantics
- Lecture 111 - The Muddy Children Puzzle
- Lecture 112 - The Effects of Epistemic Actions
- Lecture 113 - Reasoning with Beliefs

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Information Security - II

Subject Co-ordinator - Prof. V. Kamakoti

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Experimental Setup  
Lecture 2 - Need for Secure Systems  
Lecture 3 - Ignorance of A is Sin of B  
Lecture 4 - Function calls and Stacks  
Lecture 5 - Stack Smashing  
Lecture 6 - Virtual Machine Based Rootkits  
Lecture 7 - Security and Architecture  
Lecture 8 - Structured Computer Organization Completed  
Lecture 9 - X86 ISA - Part1  
Lecture 10 - X86 ISA - Part 2  
Lecture 11 - X86 Protected Mode  
Lecture 12 - X86 Memory Segmentation  
Lecture 13 - Process Isolation using Segmentation  
Lecture 14 - Paging and Virtual Memory  
Lecture 15 - Task Switching and Interrupt Service  
Lecture 16 - Memory Segmentation Deep dive - Part 1  
Lecture 17 - Memory Segmentation Deep dive - Part 2  
Lecture 18 - Memory Segmentation Deep dive - Part 3  
Lecture 19 - Memory Segmentation Deep dive - Part 4  
Lecture 20 - Segmentation Recap  
Lecture 21 - Lab 1 - Part 1  
Lecture 22 - Lab 1 - Part 2  
Lecture 23 - Lab 1 - Part 3  
Lecture 24 - ISR Recap  
Lecture 25 - Lab 2 - Part 1  
Lecture 26 - Lab 2 - Part 2  
Lecture 27 - Memory Management Recap  
Lecture 28 - Lab 3 - Part 1  
Lecture 29 - Lab 3 - Part 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Task Switch recap
- Lecture 31 - Lab 4 - Part 1
- Lecture 32 - Lab 4 - Part 2
- Lecture 33 - Lab 4 - Part 3
- Lecture 34 - Lab 4 - Part 4
- Lecture 35 - Introduction to Basic Cryptography
- Lecture 36 - Public Key Cryptography
- Lecture 37 - Freescale ARM iMX6 Processor
- Lecture 38 - High Assurance Boot in iMX6
- Lecture 39 - Case Study
- Lecture 40 - Basics of Networking
- Lecture 41 - Network Processor Vs General Purpose Processor
- Lecture 42 - Network Processor Architecture

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Algorithms for Big Data

Subject Co-ordinator - Prof. John Augustine

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Basic definitions
- Lecture 2 - Conditional probability
- Lecture 3 - Example problems
- Lecture 4 - Karger's mincut algorithm
- Lecture 5 - Analysis of Karger's mincut algorithm
- Lecture 6 - Random variables
- Lecture 7 - Randomized quicksort
- Lecture 8 - Problem solving video - The rich get richer
- Lecture 9 - Problem solving video - Monty Hall problem
- Lecture 10 - Bernoulli, Binomial and Geometric distributions
- Lecture 11 - Tail Bounds
- Lecture 12 - Application of Chernoff bound
- Lecture 13 - Application of Chebyshev's inequality
- Lecture 14 - Intro to Big Data Algorithms
- Lecture 15 - SAT Problem
- Lecture 16 - Classification of States
- Lecture 17 - Stationary Distribution of a Markov Chain
- Lecture 18 - Celebrities Case Study
- Lecture 19 - Random Walks on Undirected Graphs
- Lecture 20 - Intro to Streaming, Morris Algorithm
- Lecture 21 - Reservoir Sampling
- Lecture 22 - Approximate Median
- Lecture 23 - Overview
- Lecture 24 - Balls, bins, hashing
- Lecture 25 - Chain hashing, SUHA, Power of Two choices
- Lecture 26 - Bloom filter
- Lecture 27 - Pairwise independence
- Lecture 28 - Estimating expectation of continuous function
- Lecture 29 - Universal hash functions

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Perfect hashing
- Lecture 31 - Count-min filter for heavy hitters in data streams
- Lecture 32 - Problem solving video - Doubly Stochastic Transition Matrix
- Lecture 33 - Problem solving video - Random Walks on Linear Structures
- Lecture 34 - Problem solving video - Lollipop Graph
- Lecture 35 - Problem solving video - Cat And Mouse
- Lecture 36 - Estimating frequency moments
- Lecture 37 - Property testing framework
- Lecture 38 - Testing Connectivity
- Lecture 39 - Enforce and Test Introduction
- Lecture 40 - Testing if a graph is a biclique
- Lecture 41 - Testing bipartiteness
- Lecture 42 - Property testing and random walk algorithms
- Lecture 43 - Testing if a graph is bipartite (using random walks)
- Lecture 44 - Graph streaming algorithms: Introduction
- Lecture 45 - Graph streaming algorithms: Matching
- Lecture 46 - Graph streaming algorithms: Graph sparsification
- Lecture 47 - MapReduce
- Lecture 48 - K-Machine Model (aka Pregel Model)

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Reinforcement Learning

Subject Co-ordinator - Dr. B. Ravindran

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Tutorial 1 - Probability Basics 1  
Lecture 2 - Tutorial 1 - Probability Basics 2  
Lecture 3 - Tutorial 2 - Linear algebra - 1  
Lecture 4 - Tutorial 2 - Linear algebra - 2  
Lecture 5 - Introduction to RL  
Lecture 6 - RL Framework and applications  
Lecture 7 - Introduction to Immediate RL  
Lecture 8 - Bandit Optimalities  
Lecture 9 - Value function based methods  
Lecture 10 - UCB 1  
Lecture 11 - Concentration Bounds  
Lecture 12 - UCB 1 Theorem  
Lecture 13 - PAC Bounds  
Lecture 14 - Median Elimination  
Lecture 15 - Thompson Sampling  
Lecture 16 - Policy Search  
Lecture 17 - REINFORCE  
Lecture 18 - Contextual Bandits  
Lecture 19 - Full RL Introduction  
Lecture 20 - Returns, Value Functions and MDPs  
Lecture 21 - MDP Modelling  
Lecture 22 - Bellman Equation  
Lecture 23 - Bellman Optimality Equation  
Lecture 24 - Cauchy Sequence and Green's Equation  
Lecture 25 - Banach Fixed Point Theorem  
Lecture 26 - Convergence Proof  
Lecture 27 - L<sub>p</sub> Convergence  
Lecture 28 - Value Iteration  
Lecture 29 - Policy Iteration

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Dynamic Programming
- Lecture 31 - Monte Carlo
- Lecture 32 - Control in Monte Carlo
- Lecture 33 - Off Policy MC
- Lecture 34 - UCT
- Lecture 35 - TD(0)
- Lecture 36 - TD(0) Control
- Lecture 37 - Q-Learning
- Lecture 38 - Afterstate
- Lecture 39 - Eligibility Traces
- Lecture 40 - Backward View of Eligibility Traces
- Lecture 41 - Eligibility Trace Control
- Lecture 42 - Thompson Sampling Recap
- Lecture 43 - Function Approximation
- Lecture 44 - Linear Parameterization
- Lecture 45 - State Aggregation Methods
- Lecture 46 - Function Approximation and Eligibility Traces
- Lecture 47 - LSTD and LSTDQ
- Lecture 48 - LSPI and Fitted Q
- Lecture 49 - DQN and Fitted Q-Iteration
- Lecture 50 - Policy Gradient Approach
- Lecture 51 - Actor Critic and REINFORCE
- Lecture 52 - REINFORCE (cont'd)
- Lecture 53 - Policy Gradient with Function Approximation
- Lecture 54 - Hierarchical Reinforcement Learning
- Lecture 55 - Types of Optimality
- Lecture 56 - Semi Markov Decision Processes
- Lecture 57 - Options
- Lecture 58 - Learning with Options
- Lecture 59 - Hierarchical Abstract Machines
- Lecture 60 - MAXQ
- Lecture 61 - MAXQ Value Function Decomposition
- Lecture 62 - Option Discovery
- Lecture 63 - POMDP Introduction
- Lecture 64 - Solving POMDP

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Operating Systems

Subject Co-ordinator - Prof. Chester Rebeiro

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Intro to the Course  
Lecture 2 - Introduction to OS  
Lecture 3 - PC Hardware  
Lecture 4 - From Programs to Processes  
Lecture 5 - Sharing the CPU  
Lecture 6 - Introduction  
Lecture 7 - Virtual Memory  
Lecture 8 - MMU Mapping  
Lecture 9 - Segmentation  
Lecture 10 - Memory Management in xv6  
Lecture 11 - PC Booting  
Lecture 12 - Week 3 Introduction  
Lecture 13 - Create Execute and Exit from Processes  
Lecture 14 - System Calls for Process Management  
Lecture 15 - Interrupts  
Lecture 16 - Interrupt Handling  
Lecture 17 - Software Interrupts and System calls  
Lecture 18 - CPU Context switching  
Lecture 19 - CPU Scheduling  
Lecture 20 - Priority Based Scheduling Algorithms  
Lecture 21 - Multi-Processor Scheduling  
Lecture 22 - Scheduling in Linux  
Lecture 23 - Completely Fair Scheduling  
Lecture 24 - Inter Process Communication  
Lecture 25 - Synchronization  
Lecture 26 - Software solutions for critical sections  
Lecture 27 - Bakery Algorithm  
Lecture 28 - Hardware Locks  
Lecture 29 - Mutexes

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Semaphores
- Lecture 31 - Dining Philosophers Problem
- Lecture 32 - Deadlocks
- Lecture 33 - Dealing with Deadlocks
- Lecture 34 - Threads - Part 1
- Lecture 35 - Threads - Part 2
- Lecture 36 - Operating system security
- Lecture 37 - Information Flow policies
- Lecture 38 - Buffer Overflows
- Lecture 39 - Preventing Buffer Overflow Attacks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Programming, Data Structures and Algorithms in Python

Subject Co-ordinator - Prof. Madhavan Mukund

Co-ordinating Institute - Chennai Mathematical Institute

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Lecture 1 - Algorithms and programming  
Lecture 2 - Lecture 2 - Improving naive gcd  
Lecture 3 - Lecture 3 - Euclid's algorithm for gcd  
Lecture 4 - Lecture 4 - Downloading and installing Python  
Lecture 5 - Lecture 1 - Assignment statement, basic types - int, float, bool  
Lecture 6 - Lecture 2 - Strings  
Lecture 7 - Lecture 3 - Lists  
Lecture 8 - Lecture 4 - Control Flow  
Lecture 9 - Lecture 5 - Functions  
Lecture 10 - Lecture 6 - Examples  
Lecture 11 - Lecture 1 - More about range()  
Lecture 12 - Lecture 2 - Manipulating lists  
Lecture 13 - Lecture 3 - Breaking out of a loop  
Lecture 14 - Lecture 4 - Arrays vs lists, binary search  
Lecture 15 - Lecture 5 - Efficiency  
Lecture 16 - Lecture 6 - Selection Sort  
Lecture 17 - Lecture 7 - Insertion Sort  
Lecture 18 - Lecture 8 - Recursion  
Lecture 19 - Lecture 1 - Mergesort  
Lecture 20 - Lecture 2 - Mergesort, analysis  
Lecture 21 - Lecture 3 - Quicksort  
Lecture 22 - Lecture 4 - Quicksort analysis  
Lecture 23 - Lecture 5 - Tuples and dictionaries  
Lecture 24 - Lecture 6 - Function definitions  
Lecture 25 - Lecture 7 - List Comprehension  
Lecture 26 - Lecture 1 - Exception Handling  
Lecture 27 - Lecture 2 - Standard input and output  
Lecture 28 - Lecture 3 - Handling files  
Lecture 29 - Lecture 4 - String functions

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 30 - Lecture 5 - Formatting printed output  
Lecture 31 - Lecture 6 - pass, del() and None  
Lecture 32 - Lecture 1 - Backtracking, N queens  
Lecture 33 - Lecture 2 - Global scope, nested functions  
Lecture 34 - Lecture 3 - Generating permutations  
Lecture 35 - Lecture 4 - Sets, stacks, queues  
Lecture 36 - Lecture 5 - Priority queues and heaps  
Lecture 37 - Lecture 1 - Abstract datatypes, classes and objects  
Lecture 38 - Lecture 2 - Classes and objects in Python  
Lecture 39 - Lecture 3 - User defined lists  
Lecture 40 - Lecture 4 - Search trees  
Lecture 41 - Lecture 1 - Memoization and dynamic programming  
Lecture 42 - Lecture 2 - Grid paths  
Lecture 43 - Lecture 3 - Longest common subsequence  
Lecture 44 - Lecture 4 - Matrix multiplication  
Lecture 45 - Lecture 5 - Wrap-up, Python vs other languages

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Privacy and Security in Online Social Networks

Subject Co-ordinator - Prof. Ponnurangam Kumaraguru

Co-ordinating Institute - IIITD

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Intro to Course  
Lecture 2 - Intro to Course  
Lecture 3 - Incidents  
Lecture 4 - Tutorial 1 - Part 1 Ubuntu  
Lecture 5 - Tutorial 1 - Part 2 Python  
Lecture 6 - OSM APIs and tools for data collection  
Lecture 7 - Tutorial 2 - Part 1 Facebook API  
Lecture 8 - Tutorial 2 - Part 2 Facebook API  
Lecture 9 - Trust and Credibility on OSM  
Lecture 10 - Misinformation on Social Media  
Lecture 11 - Privacy and Social Media  
Lecture 12 - Tutorial 3 - Part 1 Twitter API  
Lecture 13 - Tutorial 3 - Part 2 MySQL  
Lecture 14 - Tutorial 3 - Part 3 MongoDB  
Lecture 15 - Privacy and Pictures on Online Social Media  
Lecture 16 - Policing and Online Social Media  
Lecture 17 - Policing and Online Social Media  
Lecture 18 - Policing and Online Social Media  
Lecture 19 - eCrime on Online Social Media  
Lecture 20 - eCrime on Online Social Media  
Lecture 21 - Tutorial 4 - Social Network Analysis  
Lecture 22 - Link Farming in Online Social Media  
Lecture 23 - Nudges  
Lecture 24 - Semantic attacks  
Lecture 25 - Tutorial 5 - Analyzing text using Python NLTK  
Lecture 26 - Profile Linking on Online Social Media  
Lecture 27 - Anonymous Networks  
Lecture 28 - Tutorial 6 - Gephi Network Visualization  
Lecture 29 - Privacy in Location Based Social Networks - Part 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Privacy in Location Based Social Networks - Part 2
- Lecture 31 - Tutorial 7 - Visualization - Highcharts
- Lecture 32 - Beware of What You Share Inferring Home Location in Social Networks
- Lecture 33 - On the dynamics of username change behavior on Twitter
- Lecture 34 - Boston Marathon Analyzing Fake Content on Twitter

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Mobile Computing

Subject Co-ordinator - Prof. Pushpendra Singh

Co-ordinating Institute - IIITD

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Java Basics  
Lecture 2 - Java  
Lecture 3 - Java  
Lecture 4 - Java  
Lecture 5 - Java  
Lecture 6 - Introduction to Android Studio  
Lecture 7 - Your First App  
Lecture 8 - Deploying your App to a Phone  
Lecture 9 - Extending app - Buttons, Toast  
Lecture 10 - Android Development Environment  
Lecture 11 - User Interface  
Lecture 12 - Application Fundamentals  
Lecture 13 - Extending the application  
Lecture 14 - Activity Lifecycle - I  
Lecture 15 - Activity Lifecycle - II  
Lecture 16 - Activity LifeCycle - III  
Lecture 17 - Adding Icon, Layouts, Handling Rotation - I  
Lecture 18 - Adding Icon, Layouts, Handling Rotation - II  
Lecture 19 - Debugging  
Lecture 20 - Intents - I  
Lecture 21 - Intents - II  
Lecture 22 - Observer Pattern  
Lecture 23 - Fragments - I  
Lecture 24 - Fragments - II  
Lecture 25 - Fragment Basic Programming Example  
Lecture 26 - Fragments - Advanced Example  
Lecture 27 - Implicit Intents  
Lecture 28 - Saving Data - I  
Lecture 29 - Saving Data - II

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Security and System Permissions
- Lecture 31 - Services
- Lecture 32 - Processes and threads
- Lecture 33 - Working with Fragments - I
- Lecture 34 - Working with Fragments - II
- Lecture 35 - Working with Fragments - III
- Lecture 36 - RecyclerView, Adapter
- Lecture 37 - RecyclerView, Adapter, ViewHolder
- Lecture 38 - ViewPager
- Lecture 39 - Dialogues

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Modern Application Development

Subject Co-ordinator - Tanmai Gopal, Prof. Gaurav Raina

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to the course
- Lecture 2 - Introduction to a web-app
- Lecture 3 - Building a web-app
- Lecture 4 - Networks
- Lecture 5 - Practical - Running your own web-server
- Lecture 6 - Protocols
- Lecture 7 - Practical - SSH + Network experiments
- Lecture 8 - Practical - Building a webapp with nodejs and using git. Introduction to reverse proxies.
- Lecture 9 - Practical - Introduction to server-side javascript and HTML/CSS
- Lecture 10 - Introduction to client-side Javascript
- Lecture 11 - Practical - APIs and mobile apps use web-servers
- Lecture 12 - Introduction to databases
- Lecture 13 - Data modelling and constraints
- Lecture 14 - Interacting with a DBMS
- Lecture 15 - Practical - Deeper exploration of a DBMS (column types and more)
- Lecture 16 - Introduction to SQL
- Lecture 17 - Understanding database performance
- Lecture 18 - Transactions and ACID properties
- Lecture 19 - Database security, backup and recovery
- Lecture 20 - Analytics and Views
- Lecture 21 - Scaling a database
- Lecture 22 - Connecting your webapp to your database and SQL Injection
- Lecture 23 - SQL and NoSQL systems
- Lecture 24 - Authentication with HTTP
- Lecture 25 - Understanding security, and some best practices for webapps
- Lecture 26 - Introduction to authentication, hashing, curl and sessions
- Lecture 27 - Introduction to mobile apps
- Lecture 28 - Introduction to Mobile Application Development Part 2
- Lecture 29 - Introduction to Android

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Getting started with Android Application Development
- Lecture 31 - Building Custom UI using XML and Logs
- Lecture 32 - Building a Blog App
- Lecture 33 - Deploying an app to the Google Play Store
- Lecture 34 - Introduction to iOS
- Lecture 35 - The API Economy

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Information Security-3

Subject Co-ordinator - Prof. V. Kamakoti

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Operating System Introduction  
Lecture 2 - Storage Hierarchy, Exceptions, Interrupts and traps  
Lecture 3 - OS Management Services  
Lecture 4 - OS Security Issues  
Lecture 5 - Process and Threads  
Lecture 6 - Process Scheduling  
Lecture 7 - Scheduling Algorithm  
Lecture 8 - Process Synchronization  
Lecture 9 - Memory Management - 1  
Lecture 10 - Memory Management - 2  
Lecture 11 - File Systems - 1  
Lecture 12 - File Systems - 2  
Lecture 13 - Unix Filesystem  
Lecture 14 - Unix Filesystem (Continued...)  
Lecture 15 - Linux  
Lecture 16 - Linux  
Lecture 17 - Linux  
Lecture 18 - Linux  
Lecture 19 - Linux  
Lecture 20 - Linux  
Lecture 21 - Linux  
Lecture 22 - Linux  
Lecture 23 - Linux  
Lecture 24 - Linux  
Lecture 25 - Basic Networking Administration  
Lecture 26 - Filesystems and Devices  
Lecture 27 - Shell Introduction  
Lecture 28 - Shell Comments and Variables  
Lecture 29 - Shell Variables

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Shell Arrays and Arithmetic
- Lecture 31 - Shell Condition and Relation
- Lecture 32 - Shell Examples
- Lecture 33 - Shell Functions
- Lecture 34 - Shell File Test
- Lecture 35 - Shell Loop Control
- Lecture 36 - Shell Script Variations
- Lecture 37 - Shell Pattern Matching
- Lecture 38 - Shell Case Statements
- Lecture 39 - Shell Co-routines
- Lecture 40 - Shell Signals and Traps
- Lecture 41 - Shell Subshell
- Lecture 42 - Shell Declarations
- Lecture 43 - Shell Examples 2
- Lecture 44 - Shell Review
- Lecture 45 - An Introduction
- Lecture 46 - Structure of a Network
- Lecture 47 - Network Core - Definition
- Lecture 48 - Network Access and Physical Media
- Lecture 49 - Structure of ISP and Packet Delays
- Lecture 50 - Network Protocol Layers
- Lecture 51 - Network Devices
- Lecture 52 - Network Security - An Introduction
- Lecture 53 - Public Key Cryptography
- Lecture 54 - Digital Signatures
- Lecture 55 - Security in Practise
- Lecture 56 - Security in Practise (Continued...)
- Lecture 57 - Wireshark
- Lecture 58 - Snort
- Lecture 59 - Review I
- Lecture 60 - Review II

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:AI:Constraint Satisfaction

Subject Co-ordinator - Prof. Deepak Khemani

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Constraint Satisfaction Problems
- Lecture 2 - CSP Examples: Map colouring, N-Queens, Classroom scheduling
- Lecture 3 - CSP Examples: Huffman-Clowes Labelling, Waltz Algorithm, Crosswords
- Lecture 4 - Model Based Diagnosis - An application of CSP
- Lecture 5 - Constraint Networks - An Introduction
- Lecture 6 - Binary Constraint Networks (BCN), Equivalent Networks
- Lecture 7 - Projection Networks
- Lecture 8 - Constraint Propagation
- Lecture 9 - Algorithms AC1 and AC3
- Lecture 10 - Can we do better than AC3?
- Lecture 11 - Algorithm AC4
- Lecture 12 - Generalized AC, Path-Consistency
- Lecture 13 - i-Consistency, Algorithm PC1
- Lecture 14 - Algorithm PC2, Strong i-Consistency
- Lecture 15 - Directional Consistency and Graph Ordering
- Lecture 16 - Min-Width and Min-Induced-Width Ordering
- Lecture 17 - Directional Arc-Consistency and Tree CSPs
- Lecture 18 - Directional Path-Consistency and Directional i-Consistency
- Lecture 19 - Backtrack-Free search and Adaptive Consistency
- Lecture 20 - Adaptive Consistency: Bucket Elimination
- Lecture 21 - Search Methods for Solving CSPs
- Lecture 22 - Algorithm Backtracking
- Lecture 23 - Look-Ahead Methods in Search
- Lecture 24 - Look-Ahead Search: Examples
- Lecture 25 - Combining Search with Reasoning: Algorithm DPLL
- Lecture 26 - Algorithm Backmarking
- Lecture 27 - Dynamic Value Ordering, Dynamic Variable Ordering
- Lecture 28 - Look-Back Methods - Definitions
- Lecture 29 - Gaschnig's Backjumping: The Culprit Variable

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Gaschnig's Backjumping, Graph-Based Backjumping
- Lecture 31 - Graph-Based Backjumping: Internal and Relevant Dead-Ends
- Lecture 32 - Conflict-Directed Backjumping: Definitions
- Lecture 33 - Algorithm Conflict-Directed Backjumping
- Lecture 34 - Combining Look-Ahead and Look-Back: FC-CBJ
- Lecture 35 - Learning During Search
- Lecture 36 - Model Based Systems
- Lecture 37 - Model Based Diagnosis
- Lecture 38 - Truth Maintenance Systems
- Lecture 39 - Planning as Constraint Satisfaction
- Lecture 40 - Planning as Constraint Satisfaction (Continued...)
- Lecture 41 - Planning as Satisfiability
- Lecture 42 - Wrapping Up and Further Study

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computer Organization

Subject Co-ordinator - Prof. V. Kamakoti

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction High Speed Circuit - Design Recursive Doubling  
Lecture 2 - High Speed Circuit Design - Fast Adder Circuits  
Lecture 3 - Lab 1  
Lecture 4 - Fast Adder Circuits (Continued...)  
Lecture 5 - Fast Multiplier Circuit  
Lecture 6 - Fast Multiplier Circuit (Continued...)  
Lecture 7 - Programming using X86 ISA - Addressing Modes  
Lecture 8 - Programming using X86 ISA - Addressing Modes  
Lecture 9 - Floating point - Precision and Accuracy  
Lecture 10 - Floating Point - Addition, Subtraction and Multiplication  
Lecture 11 - Instruction Set Architecture  
Lecture 12 - Instruction Set Architecture (Continued...)  
Lecture 13 - Lab 2  
Lecture 14 - Lab 2  
Lecture 15 - Lab 2  
Lecture 16 - Orthogonal ISA, C Constructs Mapping, Addressing Modes  
Lecture 17 - Atomic and Predicated Instructions  
Lecture 18 - Atomic and Predicated Instructions (Continued...)  
Lecture 19 - General Purpose Registers  
Lecture 20 - Expanding opcodes  
Lecture 21 - Introduction to Pipelining  
Lecture 22 - Pipelining  
Lecture 23 - Data Hazards  
Lecture 24 - Lab 2  
Lecture 25 - Dynamic Instruction Scheduling  
Lecture 26 - Dynamic Instruction Scheduling (Continued...)  
Lecture 27 - Control Hazard, Branch Prediction  
Lecture 28 - Process Management  
Lecture 29 - Branch prediction

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Global Branch Prediction
- Lecture 31 - Structural Hazard, Architectural Enhancements
- Lecture 32 - Lab 3
- Lecture 33 - Locality of Reference, Demand paging
- Lecture 34 - Page Replacement Algorithm
- Lecture 35 - Multilevel Paging, Translational Lookaside Buffer
- Lecture 36 - Multilevel Paging
- Lecture 37 - Multilevel Paging - Part 1
- Lecture 38 - Page Frame Allocation, Beledy's Anomaly
- Lecture 39 - Paging, Cache
- Lecture 40 - Cache
- Lecture 41 - Cache Organisation
- Lecture 42 - Cache - Cache Coherency, Dual Ported Cache
- Lecture 43 - Multilevel Caching, Multitasking
- Lecture 44 - Cache, Degree of Multiprogramming
- Lecture 45 - Shared Memory Architecture
- Lecture 46 - Shared Memory Architecture - Part I
- Lecture 47 - Virtually Indexed - Virtually Tagged and Physically Tagged Caches
- Lecture 48 - Lab 4
- Lecture 49 - Shared Memory Architecture, Cache Coherence
- Lecture 50 - Concurrent Programming in Hardware - Part I
- Lecture 51 - Concurrent Programming in Hardware - Part II
- Lecture 52 - Conclusion

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Wireless and Cellular Communication

Subject Co-ordinator - Prof. David Kovil Pillai

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Overview of Cellular Systems - Part 1
- Lecture 2 - Overview of Cellular Systems - Part 2
- Lecture 3 - Overview of Cellular Systems - Part 3
- Lecture 4 - 5G and other Wireless Technologies
- Lecture 5 - Basic Cellular Terminology
- Lecture 6 - Introduction to Antennas and Propagation Models
- Lecture 7 - Link budget, Fading margin, Outage
- Lecture 8 - Cellular Concept
- Lecture 9 - Cellular system design and analysis
- Lecture 10 - Cellular Geometry and System Design
- Lecture 11 - Cellular System Capacity, Trunking
- Lecture 12 - Handoff and Mobility
- Lecture 13 - Handoff Part 2, Classification of Signal Variation
- Lecture 14 - Shadowing, Outage, Multipath
- Lecture 15 - Rayleigh Fading and Statistical Characterization
- Lecture 16 - Properties of Rayleigh Distribution
- Lecture 17 - BER in Fading, Narrowband vs Wideband Channels
- Lecture 18 - Characterization of Multipath Fading Channels
- Lecture 19 - Choice of Modulation
- Lecture 20 - Coherent versus Differential Detection
- Lecture 21 - Review of Lecture 1-19
- Lecture 22 - Coherent vs Differential Detection - Part II and BER in Fading
- Lecture 23 - BER in Fading - Part II, Ricean Fading
- Lecture 24 - Ricean and Nakagami Fading, Moment Generating Function (MGF)
- Lecture 25 - MGF Part II, WSSUS Model
- Lecture 26 - WSSUS Part II, Coherence Time, Doppler Spectrum
- Lecture 27 - Doppler, Temporal Characteristics of Fading Channels
- Lecture 28 - WSSUS-Characterization of Time Dispersive Fading Channels
- Lecture 29 - WSSUS-Classification of Fading Channels

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Practical Channel Models (ITU, COST), Computer generation of Rayleigh fading
- Lecture 31 - Rayleigh Fading simulation - Clark and Gans Method, Jakesâ Method
- Lecture 32 - Jakesâ Method properties
- Lecture 33 - Introduction to Diversity, Antenna selection diversity
- Lecture 34 - Statistical Characterization of Antenna Diversity, Optimal Diversity Combining
- Lecture 35 - BER in fading, Equal Gain Combining
- Lecture 36 - Array Gain, Diversity Gain, Alamouti Scheme
- Lecture 37 - Alamouti Scheme - Part II, Channel Capacity
- Lecture 38 - Capacity of fading Channels, Capacity with Outage
- Lecture 39 - Channel State Information, Optimum Power Allocation
- Lecture 40
- Lecture 41
- Lecture 42
- Lecture 43
- Lecture 44
- Lecture 45
- Lecture 46 - (Missing)
- Lecture 47 - (Missing)
- Lecture 48 - Rake Receiver for multipath channels
- Lecture 49 - Multiuser environment
- Lecture 50 - CDMA system Capacity
- Lecture 51 - CDMA Multiuser Detectors - Part 1
- Lecture 52 - CDMA Multiuser Detectors - Part 2
- Lecture 53
- Lecture 54
- Lecture 55
- Lecture 56

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Distributed Systems

Subject Co-ordinator - Dr. Rajiv Misra

Co-ordinating Institute - IIT - Patna

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Distributed Systems
- Lecture 2 - Basic Algorithms in Message Passing System
- Lecture 3 - Leader Election in Rings
- Lecture 4 - Distributed Models of Computation, Causality and Logical Time
- Lecture 5 - Size of Vector Clock, Matrix Clocks, Virtual Time and Physical Clock Synchronization
- Lecture 6 - Global State and Snapshot Recording Algorithms
- Lecture 7 - Distributed Mutual Exclusion and Non-Token based Approaches
- Lecture 8 - Quorum Based Distributed Mutual Exclusion Approaches
- Lecture 9 - Token Based Distributed Mutual Exclusion Approaches
- Lecture 10 - Consensus and Agreement Algorithms
- Lecture 11 - Checkpointing and Rollback Recovery
- Lecture 12 - Deadlock Detection in Distributed Systems
- Lecture 13 - Distributed Shared Memory
- Lecture 14 - Distributed Minimum Spanning Tree
- Lecture 15 - Termination Detection in Distributed System
- Lecture 16 - Message Ordering and Group Communication
- Lecture 17 - Self-Stabilization
- Lecture 18 - Case Study 1 - Distributed Randomized Algorithms
- Lecture 19 - Case Study 2 - Peer-to-Peer Computing and Structured Overlay Network
- Lecture 20 - Case Study 3 - The Google File System (GFS)
- Lecture 21 - Case Study 4 - MapReduce
- Lecture 22 - Case Study 5 - HDFS
- Lecture 23 - Case Study 6 - Spark
- Lecture 24 - Case Study 7 - Distributed Algorithms for Sensor Networks
- Lecture 25 - Case Study 8 - Authentication in Distributed Systems
- Lecture 26 - Case Study 9 - Bitcoin
- Lecture 27 - Case Study 10 - BlockChain Technology

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# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Social Networks

Subject Co-ordinator - Prof. Sudarshan Iyengar

Co-ordinating Institute - IIT - Ropar

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Answer to the puzzle  
Lecture 3 - Introduction to Python - 1  
Lecture 4 - Introduction to Python - 2  
Lecture 5 - Introduction to Networkx - 1  
Lecture 6 - Introduction to Networkx - 2  
Lecture 7 - Social Networks  
Lecture 8 - Google Page Rank  
Lecture 9 - Searching in a Network  
Lecture 10 - Link Prediction  
Lecture 11 - The Contagions  
Lecture 12 - Importance of Acquaintances  
Lecture 13 - Marketing on Social Networks  
Lecture 14 - Introduction to Datasets  
Lecture 15 - Ingredients Network  
Lecture 16 - Synonymy Network  
Lecture 17 - Web Graph  
Lecture 18 - Social Network Datasets  
Lecture 19 - Datasets  
Lecture 20 - Datasets  
Lecture 21 - Datasets  
Lecture 22 - Datasets  
Lecture 23 - Introduction  
Lecture 24 - Advanced Material  
Lecture 25 - Programming Illustration  
Lecture 26 - Summary to Datasets  
Lecture 27 - Introduction  
Lecture 28 - Granovetter's Strength of weak ties  
Lecture 29 - Triads, clustering coefficient and neighborhood overlap

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Structure of weak ties, bridges, and local bridges
- Lecture 31 - Validation of Granovetter's experiment using cell phone data
- Lecture 32 - Embeddedness
- Lecture 33 - Structural Holes
- Lecture 34 - Social Capital
- Lecture 35 - Finding Communities in a graph (Brute Force Method)
- Lecture 36 - Community Detection Using Girvan Newman Algorithm
- Lecture 37 - Visualising Communities using Gephi
- Lecture 38 - Tie Strength, Social Media and Passive Engagement
- Lecture 39 - Betweenness Measures and Graph Partitioning
- Lecture 40 - Strong and Weak Relationship - Summary
- Lecture 41 - Introduction to Homophily - Should you watch your company ?
- Lecture 42 - Selection and Social Influence
- Lecture 43 - Interplay between Selection and Social Influence
- Lecture 44 - Homophily - Definition and measurement
- Lecture 45 - Foci Closure and Membership Closure
- Lecture 46 - Introduction to Fatman Evolutionary model
- Lecture 47 - Fatman Evolutionary Model - The Base Code (Adding people)
- Lecture 48 - Fatman Evolutionary Model - The Base Code (Adding Social Foci)
- Lecture 49 - Fatman Evolutionary Model - Implementing Homophily
- Lecture 50 - Quantifying the Effect of Triadic Closure
- Lecture 51 - Fatman Evolutionary Model - Implementing Closures
- Lecture 52 - Fatman Evolutionary Model - Implementing Social Influence
- Lecture 53 - Fatman Evolutionary Model - Storing and analyzing longitudinal data
- Lecture 54 - Spatial Segregation
- Lecture 55 - Spatial Segregation
- Lecture 56 - Spatial Segregation
- Lecture 57 - Schelling Model Implementation - 1 (Introduction)
- Lecture 58 - Schelling Model Implementation - 2 (Base Code)
- Lecture 59 - Schelling Model Implementation - 3 (Visualization and Getting a list of boundary and internal nodes)
- Lecture 60 - Schelling Model Implementation - 4 (Getting a list of unsatisfied nodes)
- Lecture 61 - Schelling Model Implementation - 5 (Shifting the unsatisfied nodes and visualizing the final graph)
- Lecture 62 - Chapter - 5 Positive and Negative Relationships (Introduction)
- Lecture 63 - Structural Balance
- Lecture 64 - Enemy'S Enemy is a Friend
- Lecture 65 - Characterizing the Structure of Balanced Networks
- Lecture 66 - Balance Theorem
- Lecture 67 - Proof of Balance Theorem
- Lecture 68 - Introduction to positive and negative edges

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- Lecture 69 - Outline of implementation
- Lecture 70 - Creating graph, displaying it and counting unstable triangles
- Lecture 71 - Moving a network from an unstable to stable state
- Lecture 72 - Forming two coalitions
- Lecture 73 - Forming two coalitions (Continued...)
- Lecture 74 - Visualizing coalitions and the evolution
- Lecture 75 - The Web Graph
- Lecture 76 - Collecting the Web Graph
- Lecture 77 - Equal Coin Distribution
- Lecture 78 - Random Coin Dropping
- Lecture 79 - Google Page Ranking Using Web Graph
- Lecture 80 - Implementing PageRank Using Points Distribution Method - 1
- Lecture 81 - Implementing PageRank Using Points Distribution Method - 2
- Lecture 82 - Implementing PageRank Using Points Distribution Method - 3
- Lecture 83 - Implementing PageRank Using Points Distribution Method - 4
- Lecture 84 - Implementing PageRank Using Random Walk Method - 1
- Lecture 85 - Implementing PageRank Using Random Walk Method - 2
- Lecture 86 - DegreeRank versus PageRank
- Lecture 87 - We Follow
- Lecture 88 - Why do we Follow?
- Lecture 89 - Diffusion in Networks
- Lecture 90 - Modeling Diffusion
- Lecture 91 - Modeling Diffusion (Continued...)
- Lecture 92 - Impact of Communities on Diffusion
- Lecture 93 - Cascade and Clusters
- Lecture 94 - Knowledge, Thresholds and the Collective Action
- Lecture 95 - An Introduction to the Programming Screencast (Coding 4 major ideas)
- Lecture 96 - The Base Code
- Lecture 97 - Coding the First Big Idea - Increasing the Payoff
- Lecture 98 - Coding the Second Big Idea - Key People
- Lecture 99 - Coding the Third Big Idea - Impact of Communities on Cascades
- Lecture 100 - Coding the Fourth Big Idea - Cascades and Clusters
- Lecture 101 - Introduction to Hubs and Authorities (A Story)
- Lecture 102 - Principle of Repeated Improvement (A story)
- Lecture 103 - Principle of Repeated Improvement (An example)
- Lecture 104 - Hubs and Authorities
- Lecture 105 - PageRank Revisited - An example
- Lecture 106 - PageRank Revisited - Convergence in the Example
- Lecture 107 - PageRank Revisited - Conservation and Convergence

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 108 - PageRank, conservation and convergence - Another example
- Lecture 109 - Matrix Multiplication (Pre-requisite 1)
- Lecture 110 - Convergence in Repeated Matrix Multiplication (Pre-requisite 1)
- Lecture 111 - Addition of Two Vectors (Pre-requisite 2)
- Lecture 112 - Convergence in Repeated Matrix Multiplication- The Details
- Lecture 113 - PageRank as a Matrix Operation
- Lecture 114 - PageRank Explained
- Lecture 115 - Introduction to Powerlaw
- Lecture 116 - Why do Normal Distributions Appear?
- Lecture 117 - Power Law emerges in WWW graphs
- Lecture 118 - Detecting the Presence of Powerlaw
- Lecture 119 - Rich Get Richer Phenomenon
- Lecture 120 - Summary So Far
- Lecture 121 - Implementing Rich-getting-richer Phenomenon (Barabasi-Albert Model) - 1
- Lecture 122 - Implementing Rich-getting-richer Phenomenon (Barabasi-Albert Model) - 2
- Lecture 123 - Implementing a Random Graph (Erdos-Renyi Model) - 1
- Lecture 124 - Implementing a Random Graph (Erdos-Renyi Model) - 2
- Lecture 125 - Forced Versus Random Removal of Nodes (Attack Survivability)
- Lecture 126 - Rich Get Richer - A Possible Reason
- Lecture 127 - Rich Get Richer - The Long Tail
- Lecture 128 - Epidemics- An Introduction
- Lecture 129 - Introduction to epidemics (Continued...)
- Lecture 130 - Simple Branching Process for Modeling Epidemics
- Lecture 131 - Simple Branching Process for Modeling Epidemics (Continued...)
- Lecture 132 - Basic Reproductive Number
- Lecture 133 - Modeling epidemics on complex networks
- Lecture 134 - SIR and SIS spreading models
- Lecture 135 - Comparison between SIR and SIS spreading models
- Lecture 136 - Basic Reproductive Number Revisited for Complex Networks
- Lecture 137 - Percolation model
- Lecture 138 - Analysis of basic reproductive number in branching model (The problem statement)
- Lecture 139 - Analyzing basic reproductive number - 2
- Lecture 140 - Analyzing basic reproductive number - 3
- Lecture 141 - Analyzing basic reproductive number - 4
- Lecture 142 - Analyzing basic reproductive number - 5
- Lecture 143 - Small World Effect - An Introduction
- Lecture 144 - Milgram's Experiment
- Lecture 145 - The Reason
- Lecture 146 - The Generative Model

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 147 - Decentralized Search - I
- Lecture 148 - Decentralized Search - II
- Lecture 149 - Decentralized Search - III
- Lecture 150 - Programming illustration- Small world networks
- Lecture 151 - Base code
- Lecture 152 - Making homophily based edges
- Lecture 153 - Adding weak ties
- Lecture 154 - Plotting change in diameter
- Lecture 155 - Programming illustration- Myopic Search
- Lecture 156 - Myopic Search
- Lecture 157 - Myopic Search comparison to optimal search
- Lecture 158 - Time Taken by Myopic Search
- Lecture 159 - PseudoCores
- Lecture 160 - How to be Viral
- Lecture 161 - Who are the right key nodes?
- Lecture 162 - finding the right key nodes (the core)
- Lecture 163 - Coding K-Shell Decomposition
- Lecture 164 - Coding cascading Model
- Lecture 165 - Coding the importance of core nodes in cascading
- Lecture 166 - Pseudo core

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:An Introduction to Probability in Computing

Subject Co-ordinator - Prof. John Augustine

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Probability - A box of chocolates
- Lecture 2 - Introduction to Probability - Axiomatic Approach to Probability Theory
- Lecture 3 - Introduction to Probability - Verifying Matrix Multiplication (Statement, Algorithm and Independence)
- Lecture 4 - Introduction to Probability - Verifying Matrix Multiplication (Correctness and Law of Total Probability)
- Lecture 5 - Introduction to Probability - How Strong is your Network?
- Lecture 6 - Introduction to Probability - How to Understand the World? Play with it!
- Lecture 7 - Tutorial 1
- Lecture 8 - Tutorial 2
- Lecture 9 - Discrete Random Variables - Basic Definitions
- Lecture 10 - Discrete Random Variables - Linearity of Expectation and Jensen's Inequality
- Lecture 11 - Discrete Random Variables - Conditional Expectation I
- Lecture 12 - Discrete Random Variables - Conditional Expectation II
- Lecture 13 - Discrete Random Variables - Geometric Random Variables and Collecting Coupons
- Lecture 14 - Discrete Random Variables - Randomized Selection
- Lecture 15 - Tail Bounds I - Markov's Inequality
- Lecture 16 - Tail Bounds I - The Second Moment, Variance and Chebyshev's Inequality
- Lecture 17 - Tail Bounds I - Median via Sampling
- Lecture 18 - Tail Bounds I - Median via Sampling - Analysis
- Lecture 19 - Tail Bounds I - Moment Generating Functions and Chernoff Bounds
- Lecture 20 - Tail Bounds I - Parameter Estimation
- Lecture 21 - Tail Bounds I - Control Group Selection
- Lecture 22 - Applications of Tail Bounds - Routing in Sparse Networks
- Lecture 23 - Applications of Tail Bounds - Analysis of Valiant's Routing
- Lecture 24 - Applications of Tail Bounds - Random Graphs
- Lecture 25 - Live Session 2
- Lecture 26 - Live Session

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Human Computer Interaction

Subject Co-ordinator - Prof. Ponnurangam Kumaraguru

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Human Computer Interaction
- Lecture 2 - What is HCI? Commonalities and Differences in Interfaces
- Lecture 3 - Door handle, Elevators, Contextual Inquiry, Affinity Diagrams
- Lecture 4 - Lab Session Contextual Inquiry
- Lecture 5 - Lab Session Affinity Diagram
- Lecture 6 - Tutorial on Photoshop
- Lecture 7 - Tutorial on UI Designing using Photoshop
- Lecture 8 - Institutional Review Board, Ethics committee, IRB documents / application, consent form
- Lecture 9 - Tutorial on Proto.io
- Lecture 10 - Tutorial on Lookback
- Lecture 11 - How to understand user needs? Surveys, Questionnaire
- Lecture 12 - How to understand user needs? Surveys, Questionnaire - Continues
- Lecture 13 - Prototyping
- Lecture 14 - User-Centered Design
- Lecture 15 - Lab Session
- Lecture 16 - Design Patterns
- Lecture 17 - Lab Session
- Lecture 18 - Usable security
- Lecture 19 - Lab Session
- Lecture 20 - Continuity of Usable Security
- Lecture 21 - Visual Design
- Lecture 22 - Visual Design - 2
- Lecture 23 - Crypto price Tracker App
- Lecture 24 - Interacto
- Lecture 25 - Tech Hinder
- Lecture 26 - busKARO
- Lecture 27 - MayMayMe
- Lecture 28 - noWhinge

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Information Security-IV

Subject Co-ordinator - Prof.M J Shankar Raman, Prof. V. Kamakoti, Prof.Vasan

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - WISE Gen and The IT Revolution - 1
- Lecture 2 - WISE Gen and The IT Revolution - 1 (Continued...)
- Lecture 3 - WISE GEN - Next Step
- Lecture 4 - Network Security
- Lecture 5 - Symmetric Key Cryptography and Digital Signatures
- Lecture 6 - Basic Network Security Components
- Lecture 7 - Internet Security Threats
- Lecture 8 - History of Kali Linux
- Lecture 9 - Penetration Testing with Kali Linux
- Lecture 10 - Network Security and Forensics Introduction - I
- Lecture 11 - Network Security and Forensics Introduction - II
- Lecture 12 - Penetration Testing
- Lecture 13 - Penetration testing steps in Kali Linux
- Lecture 14 - Kali Linux Installation
- Lecture 15 - Reconnaissance - Part I
- Lecture 16 - Reconnaissance - Part II
- Lecture 17 - Serverside Attacks
- Lecture 18 - Serverside Attacks
- Lecture 19 - Serverside Attacks
- Lecture 20 - Serverside Attacks
- Lecture 21 - Serverside Attacks
- Lecture 22 - Serverside Attacks
- Lecture 23 - Client Side Attacks - Tools in Kali Linux - 1
- Lecture 24 - Client Side Attacks - Tools in Kali Linux - 2
- Lecture 25 - Client Side Attacks - Tools in Kali Linux - 3
- Lecture 26 - Client Side Attacks - Tools in Kali Linux - 4
- Lecture 27 - Authentication Based Attacks - Tools in Kali Linux - 1
- Lecture 28 - Authentication Based Attacks - Tools in Kali Linux - 2
- Lecture 29 - Authentication Based Attacks - Tools in Kali Linux - 3

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Authentication Based Attacks - Tools in Kali Linux - 4
- Lecture 31 - Authentication Based Attacks - Tools in Kali Linux - 5
- Lecture 32 - Web Attacks - Tools in Kali Linux - 1
- Lecture 33 - Web Attacks - Tools in Kali Linux - 2
- Lecture 34 - Penetration Testing Attacks - Defensive Countermeasures
- Lecture 35 - Technical Fundamentals for Evidence Acquisition - 1
- Lecture 36 - Technical Fundamentals for Evidence Acquisition - 2
- Lecture 37 - Packet Capture Tools and Methods
- Lecture 38 - Wireshark Introduction
- Lecture 39 - Packet Analysis
- Lecture 40 - Flow Analysis
- Lecture 41 - Case study 1
- Lecture 42 - Case study 1 (Continued...)
- Lecture 43 - Wireless Forensics - Technology
- Lecture 44 - Wireless Network Security Framework
- Lecture 45 - Wireless Access Points - Security issues
- Lecture 46 - Case Study 2 - Use of tools
- Lecture 47 - Network Security Devices - IDS
- Lecture 48 - IDS Evidence Acquisition and SNORT
- Lecture 49 - SNORT Rules
- Lecture 50 - SNORT Installation
- Lecture 51 - SNORT Configuration and Demonstration
- Lecture 52 - Evidence collection in Switches and Routers
- Lecture 53 - Evidence collection in Routers and Firewalls
- Lecture 54 - IPTables rules and tool usage
- Lecture 55 - Logs, Rules and Automated Tools
- Lecture 56 - Re-cap of All Topics
- Lecture 57 - Introduction to Meltdown Attack
- Lecture 58 - Introduction to Meltdown - Address Space Basics
- Lecture 59 - Meltdown Attack - Out of Order Execution
- Lecture 60 - Meltdown Attack - Recovering from Exception

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Data Science for Engineers

Subject Co-ordinator - Prof. Shankar Narasimhan, Prof. Ragunathan Rengasamy

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Data science for engineers Course philosophy and expectation

Lecture 2 - Introduction to R

Lecture 3 - Introduction to R (Continued...)

Lecture 4 - Variables and datatypes in R

Lecture 5 - Data frames

Lecture 6 - Recasting and joining of dataframes

Lecture 7 - Arithmetic, Logical and Matrix operations in R

Lecture 8 - Advanced programming in R

Lecture 9 - Advanced Programming in R

Lecture 10 - Control structures

Lecture 11 - Data visualization in R Basic graphics

Lecture 12 - Linear Algebra for Data science

Lecture 13 - Solving Linear Equations

Lecture 14 - Solving Linear Equations (Continued...)

Lecture 15 - Linear Algebra - Distance, Hyperplanes and Halfspaces, Eigenvalues, Eigenvectors

Lecture 16 - Linear Algebra - Distance, Hyperplanes and Halfspaces, Eigenvalues, Eigenvectors (Continued... 1)

Lecture 17 - Linear Algebra - Distance, Hyperplanes and Halfspaces, Eigenvalues, Eigenvectors (Continued... 2)

Lecture 18 - Linear Algebra - Distance, Hyperplanes and Halfspaces, Eigenvalues, Eigenvectors (Continued... 3)

Lecture 19 - Statistical Modelling

Lecture 20 - Random Variables and Probability Mass/Density Functions

Lecture 21 - Sample Statistics

Lecture 22 - Hypotheses Testing

Lecture 23 - Optimization for Data Science

Lecture 24 - Unconstrained Multivariate Optimization

Lecture 25 - Unconstrained Multivariate Optimization (Continued...)

Lecture 26 - Gradient (Steepest) Descent (OR) Learning Rule

Lecture 27 - Multivariate Optimization With Equality Constraints

Lecture 28 - Multivariate Optimization With Inequality Constraints

Lecture 29 - Introduction to Data Science

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Solving Data Analysis Problems - A Guided Thought Process
- Lecture 31 - Module
- Lecture 32 - Linear Regression
- Lecture 33 - Model Assessment
- Lecture 34 - Diagnostics to Improve Linear Model Fit
- Lecture 35 - Simple Linear Regression Model Building
- Lecture 36 - Simple Linear Regression Model Assessment
- Lecture 37 - Simple Linear Regression Model Assessment (Continued...)
- Lecture 38 - Multiple Linear Regression
- Lecture 39 - Cross Validation
- Lecture 40 - Multiple Linear Regression Modelling Building and Selection
- Lecture 41 - Classification
- Lecture 42 - Logistic Regression
- Lecture 43 - Logistic Regression (Continued...)
- Lecture 44 - Performance Measures
- Lecture 45 - Logistic Regression Implementation in R
- Lecture 46 - K-Nearest Neighbors (kNN)
- Lecture 47 - K-Nearest Neighbors implementation in R
- Lecture 48 - K-means Clustering
- Lecture 49 - K-means implementation in R
- Lecture 50 - Data Science for engineers - Summary

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:The Joy of Computing using Python

Subject Co-ordinator - Prof. Sudarshan Iyengar

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Programming
- Lecture 2 - Why Programming ?
- Lecture 3 - Programming for Everybody
- Lecture 4 - Any Prerequisites ?
- Lecture 5 - Where to start?
- Lecture 6 - Why do we have so many languages?
- Lecture 7 - How to go about programming?
- Lecture 8 - Why to learn programming?
- Lecture 9 - What is programming?
- Lecture 10 - How to give instructions ?
- Lecture 11 - Introduction To Scratch
- Lecture 12 - Introduction To Loops
- Lecture 13 - More About Loops
- Lecture 14 - Solution To Looping Problem
- Lecture 15 - Scratch
- Lecture 16 - Scratch
- Lecture 17 - Scratch
- Lecture 18 - More On Scratch
- Lecture 19 - Introduction to Anaconda
- Lecture 20 - Installation of Anaconda
- Lecture 21 - Introduction to Spyder IDE
- Lecture 22 - Printing statements in Python
- Lecture 23 - Understanding Variables in Python
- Lecture 24 - Executing a sequence of instructions in the Console
- Lecture 25 - Writing your First Program
- Lecture 26 - Taking inputs from the user
- Lecture 27 - Discount Calculation
- Lecture 28 - Motivation to if condition
- Lecture 29 - A reminder on how to deal with numbers

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Understanding if condition's working
- Lecture 31 - Realizing the importance of syntax and indentation
- Lecture 32 - Introductions to loops
- Lecture 33 - Loops
- Lecture 34 - Loops
- Lecture 35 - Loops
- Lecture 36 - Introduction to While Loop
- Lecture 37 - Lists Part 1
- Lecture 38 - Lists Part 2
- Lecture 39 - Lists Part 3
- Lecture 40 - Lists Part 4
- Lecture 41 - Loops and Conditionals
- Lecture 42 - Loops and Conditionals
- Lecture 43 - Crowd Computing - Just estimate 01
- Lecture 44 - Crowd Computing - Just estimate 02
- Lecture 45 - Crowd Computing - Just estimate 03
- Lecture 46 - Crowd Computing - Just estimate 04
- Lecture 47 - Crowd Computing - Just estimate 05
- Lecture 48 - Crowd Computing - Just estimate 06
- Lecture 49 - Permutations - Jumbled Words 01
- Lecture 50 - Permutations - Jumbled Words 02
- Lecture 51 - Permutations - Jumbled Words 03
- Lecture 52 - Theory of Evolution 01
- Lecture 53 - Theory of Evolution 02
- Lecture 54 - Theory of Evolution 03
- Lecture 55 - Theory of Evolution 04
- Lecture 56 - Practice is the key
- Lecture 57 - Magic Square Hit and Trial 01
- Lecture 58 - Magic Square Hit and Trial 02
- Lecture 59 - Magic Square Hit and Trial 03
- Lecture 60 - Magic Square Hit and Trial 04
- Lecture 61 - Magic Square Hit and Trial 05
- Lecture 62 - Let's program and play
- Lecture 63 - Dobble Game - Spot the similarity 01
- Lecture 64 - Dobble Game - Spot the similarity 02
- Lecture 65 - Dobble Game - Spot the similarity 03
- Lecture 66 - Dobble Game - Spot the similarity 04
- Lecture 67 - What is your date of birth?
- Lecture 68 - Birthday Paradox - Find your twin 01

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 69 - Birthday Paradox - Find your twin 02  
Lecture 70 - Birthday Paradox - Find your twin 03  
Lecture 71 - Birthday Paradox - Find your twin 04  
Lecture 72 - Birthday Paradox - Find your twin 05  
Lecture 73 - What's your favourite movie?  
Lecture 74 - Guess the Movie Name 01  
Lecture 75 - Guess the Movie Name 02  
Lecture 76 - Guess the Movie Name 03  
Lecture 77 - Guess the Movie Name 04  
Lecture 78 - Guess the Movie Name 05  
Lecture 79 - Guess the Movie Name 06  
Lecture 80 - Dictionaries  
Lecture 81 - Speech to Text  
Lecture 82 - Speech to Text  
Lecture 83 - Speech to Text  
Lecture 84 - Monte Hall  
Lecture 85 - Monte Hall  
Lecture 86 - Rock, Paper and Scissor  
Lecture 87 - Rock, Paper and Scissor  
Lecture 88 - Rock, Paper and Scissor  
Lecture 89 - Rock, Paper and Scissor  
Lecture 90 - Sorting and Searching  
Lecture 91 - Sorting and Searching  
Lecture 92 - Sorting and Searching  
Lecture 93 - Sorting and Searching  
Lecture 94 - Sorting and Searching  
Lecture 95 - Sorting and Searching  
Lecture 96 - Sorting and Searching  
Lecture 97 - Sorting and Searching  
Lecture 98 - Substitution Cipher -The science of secrecy  
Lecture 99 - Substitution Cipher -The science of secrecy 01  
Lecture 100 - Substitution Cipher -The science of secrecy 02  
Lecture 101 - Substitution Cipher -The science of secrecy 03  
Lecture 102 - Tic Tac Toe - Down the memory Lane  
Lecture 103 - Tic Tac Toe - Down the memory Lane 01  
Lecture 104 - Tic Tac Toe - Down the memory Lane 02  
Lecture 105 - Tic Tac Toe - Down the memory Lane 03  
Lecture 106 - Tic Tac Toe - Down the memory Lane 04  
Lecture 107 - Tic Tac Toe - Down the memory Lane 05

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Lecture 108 - Recursion  
Lecture 109 - Recursion 01  
Lecture 110 - Recursion 02  
Lecture 111 - Recursion 03  
Lecture 112 - Recursion 04  
Lecture 113 - Recursion 05  
Lecture 114 - Recursion 06  
Lecture 115 - Snakes and Ladders - Not on the Board  
Lecture 116 - Snakes and Ladders - Not on the Board - Part 01  
Lecture 117 - Snakes and Ladders - Not on the Board - Part 02  
Lecture 118 - Snakes and Ladders - Not on the Board - Part 03  
Lecture 119 - Snakes and Ladders - Not on the Board - Part 04  
Lecture 120 - Snakes and Ladders - Not on the Board - Part 05  
Lecture 121 - Snakes and Ladders - Not on the Board - Part 06  
Lecture 122 - Spiral Traversing - Let's Animate  
Lecture 123 - Spiral Traversing - Let's Animate - Part 01  
Lecture 124 - Spiral Traversing - Let's Animate - Part 02  
Lecture 125 - Spiral Traversing - Let's Animate - Part 03  
Lecture 126 - Spiral Traversing - Let's Animate - Part 04  
Lecture 127 - Spiral Traversing - Let's Animate - Part 05  
Lecture 128 - Spiral Traversing - Let's Animate - Part 06  
Lecture 129 - Spiral Traversing - Let's Animate - Part 07  
Lecture 130 - GPS - Track the route  
Lecture 131 - GPS - Track the route - Part 01  
Lecture 132 - GPS - Track the route - Part 02  
Lecture 133 - GPS - Track the route - Part 03  
Lecture 134 - GPS - Track the route - Part 04  
Lecture 135 - Tuples- Python Data Structure  
Lecture 136 - Lottery Simulation - Profit or Loss  
Lecture 137 - Lottery Simulation - Profit or Loss - Part 01  
Lecture 138 - Lottery Simulation - Profit or Loss - Part 02  
Lecture 139 - Lottery Simulation - Profit or Loss - Part 03  
Lecture 140 - Lottery Simulation - Profit or Loss - Part 04  
Lecture 141 - Lottery Simulation - Profit or Loss - Part 05  
Lecture 142 - Lottery Simulation - Profit or Loss - Part 06  
Lecture 143 - Image Processing - Enhance your images  
Lecture 144 - Image Processing - Enhance your images - Part 01  
Lecture 145 - Image Processing - Enhance your images - Part 02  
Lecture 146 - Image Processing - Enhance your images - Part 03

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Lecture 147 - Anagrams  
Lecture 148 - Anagrams - Part 01  
Lecture 149 - Anagrams - Part 02  
Lecture 150 - Anagrams - Part 03  
Lecture 151 - Anagrams - Part 04  
Lecture 152 - Facebook Sentiment Analysis  
Lecture 153 - Facebook Sentiment Analysis - Part 01  
Lecture 154 - Facebook Sentiment Analysis - Part 02  
Lecture 155 - Facebook Sentiment Analysis - Part 03  
Lecture 156 - Facebook Sentiment Analysis - Part 04  
Lecture 157 - Natural Language Processing - Author Stylometry  
Lecture 158 - Natural Language Processing - Author Stylometry - Part 01  
Lecture 159 - Natural Language Processing - Author Stylometry - Part 02  
Lecture 160 - Natural Language Processing - Author Stylometry - Part 03  
Lecture 161 - Natural Language Processing - Author Stylometry - Part 04  
Lecture 162 - Natural Language Processing - Author Stylometry - Part 05  
Lecture 163 - Natural Language Processing - Author Stylometry - Part 06  
Lecture 164 - Natural Language Processing - Author Stylometry - Part 07  
Lecture 165 - Natural Language Processing - Author Stylometry - Part 08  
Lecture 166 - Natural Language Processing - Author Stylometry - Part 09  
Lecture 167 - Natural Language Processing - Author Stylometry - Part 10  
Lecture 168 - Introduction to Networkx - Part 01  
Lecture 169 - Introduction to Networkx - Part 02  
Lecture 170 - Six Degrees of Separation  
Lecture 171 - Six Degrees of Separation  
Lecture 172 - Six Degrees of Separation  
Lecture 173 - Six Degrees of Separation  
Lecture 174 - Area Calculation - Don't Measure  
Lecture 175 - Area Calculation - Don't Measure - Part 01  
Lecture 176 - Area Calculation - Don't Measure - Part 02  
Lecture 177 - Area Calculation - Don't Measure - Part 03  
Lecture 178 - Area Calculation - Don't Measure - Part 04  
Lecture 179 - Area Calculation - Don't Measure - Part 05  
Lecture 180 - Area Calculation - Don't Measure - Part 06  
Lecture 181 - FLAMES - Part 01  
Lecture 182 - FLAMES - Part 02  
Lecture 183 - FLAMES - Part 03  
Lecture 184 - FLAMES - Part 04  
Lecture 185 - FLAMES - Part 05

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 186 - FLAMES - Part 06  
Lecture 187 - Data Compression - Part 01  
Lecture 188 - Data Compression - Part 02  
Lecture 189 - Data Compression - Part 03  
Lecture 190 - Data Compression - Part 04  
Lecture 191 - Data Compression - Part 05  
Lecture 192 - Browser Automation Watsapp using Python - Part 01  
Lecture 193 - Browser Automation Watsapp using Python - Part 02  
Lecture 194 - Browser Automation Watsapp using Python - Part 03  
Lecture 195 - Browser Automation Watsapp using Python - Part 04  
Lecture 196 - Fun with Calendar - Part 01  
Lecture 197 - Fun with Calendar - Part 02  
Lecture 198 - Fun with Calendar - Part 03  
Lecture 199 - Fun with Calendar - Part 04  
Lecture 200 - Fun with Calendar - Part 05  
Lecture 201 - Fun with Calendar - Part 06  
Lecture 202 - Fun with Calendar - Part 07  
Lecture 203 - Fun with Calendar - Part 08  
Lecture 204 - Fun with Calendar - Part 09  
Lecture 205 - Fun with Calendar - Part 10  
Lecture 206 - Fun with Calendar - Part 11  
Lecture 207 - Fun with Calendar - Part 12  
Lecture 208 - Page Rank - How does Google Work ? - Part 01  
Lecture 209 - Page Rank - How does Google Work ? - Part 02  
Lecture 210 - Page Rank - How does Google Work ? - Part 03  
Lecture 211 - Page Rank - How does Google Work ? - Part 04  
Lecture 212 - Page Rank - How does Google Work ? - Part 05  
Lecture 213 - Page Rank - How does Google Work ? - Part 06  
Lecture 214 - Page Rank - How does Google Work ? - Part 07  
Lecture 215 - Page Rank - How does Google Work ? - Part 08  
Lecture 216 - Page Rank - How does Google Work ? - Part 09  
Lecture 217 - Page Rank - How does Google Work ? - Part 10  
Lecture 218 - Page Rank - How does Google Work ? - Part 11  
Lecture 219 - Page Rank - How does Google Work ? - Part 12  
Lecture 220 - Page Rank - How does Google Work ? - Part 13  
Lecture 221 - Page Rank - How does Google Work ? - Part 14  
Lecture 222 - Page Rank - How does Google Work ? - Part 15  
Lecture 223 - Page Rank - How does Google Work ? - Part 16  
Lecture 224 - Collatz Conjecture - Part 01

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Lecture 225 - Collatz Conjecture - Part 02  
Lecture 226 - JOC Conclusion

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# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Discrete Mathematics

Subject Co-ordinator - Prof. Sudarshan Iyengar

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Motivation for Counting  
Lecture 2 - Paper Folding Example  
Lecture 3 - Rubik's Cube Example  
Lecture 4 - Factorial Example  
Lecture 5 - Counting in Computer Science  
Lecture 6 - Motivation for Catalan numbers  
Lecture 7 - Rule of Sum and Rule of Product  
Lecture 8 - Problems on Rule of Sum and Rule of Product  
Lecture 9 - Factorial Explained  
Lecture 10 - Proof of  $n!$  - Part 1  
Lecture 11 - Proof of  $n!$  - Part 2  
Lecture 12 - Astronomical Numbers  
Lecture 13 - Permutations - Part 1  
Lecture 14 - Permutations - Part 2  
Lecture 15 - Permutations - Part 3  
Lecture 16 - Permutations - Part 4  
Lecture 17 - Problems on Permutations  
Lecture 18 - Combinations - Part 1  
Lecture 19 - Combinations - Part 2  
Lecture 20 - Combinations - Part 3  
Lecture 21 - Combinations - Part 4  
Lecture 22 - Problems on Combinations  
Lecture 23 - Difference between Permutations and Combinations  
Lecture 24 - Combination with Repetition - Part 1  
Lecture 25 - Combination with Repetition - Part 2  
Lecture 26 - Combination with Repetition - Problems  
Lecture 27 - Binomial theorem  
Lecture 28 - Applications of Binomial theorem  
Lecture 29 - Properties of Binomial theorem

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## NPTTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Multinomial theorem
- Lecture 31 - Problems on Binomial theorem
- Lecture 32 - Pascal's Triangle
- Lecture 33 - Fun facts on Pascal's Triangle
- Lecture 34 - Catalan Numbers - Part 1
- Lecture 35 - Catalan Numbers - Part 2
- Lecture 36 - Catalan Numbers - Part 3
- Lecture 37 - Catalan Numbers - Part 4
- Lecture 38 - Examples of Catalan numbers
- Lecture 39 - Chapter Summary
- Lecture 40 - Introduction to Set Theory
- Lecture 41 - Example, definition and notation
- Lecture 42 - Sets - Problems Part 1
- Lecture 43 - Subsets - Part 1
- Lecture 44 - Subsets - Part 2
- Lecture 45 - Subsets - Part 3
- Lecture 46 - Union and intersections of sets
- Lecture 47 - Union and intersections of sets - Part 1
- Lecture 48 - Union and intersections of sets - Part 2
- Lecture 49 - Union and intersections of sets - Part 3
- Lecture 50 - Cardinality of Union of two sets - Part 1
- Lecture 51 - Cardinality of Union of two sets - Part 2
- Lecture 52 - Cardinality of Union of three sets
- Lecture 53 - Power Set - Part 1
- Lecture 54 - Power set - Part 2
- Lecture 55 - Power set - Part 3
- Lecture 56 - Connection between Binomial Theorem and Power Sets
- Lecture 57 - Power set - Problems
- Lecture 58 - Complement of a set
- Lecture 59 - De Morgan's Laws - Part 1
- Lecture 60 - De Morgan's Laws - Part 2
- Lecture 61 - A proof technique
- Lecture 62 - De Morgan's Laws - Part 3
- Lecture 63 - De Morgan's Laws - Part 4
- Lecture 64 - Set difference - Part 1
- Lecture 65 - Set difference - Part 2
- Lecture 66 - Symmetric difference
- Lecture 67 - History
- Lecture 68 - Summary

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Motivational example
- Lecture 70 - Introduction to Statements
- Lecture 71 - Examples and Non-examples of Statements
- Lecture 72 - Introduction to Negation
- Lecture 73 - Negation - Explanation
- Lecture 74 - Negation - Truthtable
- Lecture 75 - Examples for Negation
- Lecture 76 - Motivation for OR operator
- Lecture 77 - Introduction to OR operator
- Lecture 78 - Truthtable for OR operator
- Lecture 79 - OR operator for 3 Variables
- Lecture 80 - Truthtable for AND operator
- Lecture 81 - AND operator for 3 Variables
- Lecture 82 - Primitive and Compound statements - Part 1
- Lecture 83 - Primitive and Compound statements - Part 2
- Lecture 84 - Problems involving NOT, OR and AND operators
- Lecture 85 - Introduction to implication
- Lecture 86 - Examples and Non-examples of Implication - Part 1
- Lecture 87 - Examples and Non-examples of Implication - Part 2
- Lecture 88 - Explanation of Implication
- Lecture 89 - Introduction to Double Implication
- Lecture 90 - Explanation of Double Implication
- Lecture 91 - Converse, Inverse and Contrapositive
- Lecture 92 - XOR operator - Part 1
- Lecture 93 - XOR operator - Part 2
- Lecture 94 - XOR operator - Part 3
- Lecture 95 - Problems
- Lecture 96 - Tautology, Contradiction - Part 1
- Lecture 97 - Tautology, Contradiction - Part 2
- Lecture 98 - Tautology, Contradiction - Part 3
- Lecture 99 - SAT Problem - Part 1
- Lecture 100 - SAT Problem - Part 2
- Lecture 101 - Logical Equivalence - Part 1
- Lecture 102 - Logical Equivalence - Part 2
- Lecture 103 - Logical Equivalence - Part 3
- Lecture 104 - Logical Equivalence - Part 4
- Lecture 105 - Motivation for laws of logic
- Lecture 106 - Double negation - Part 1
- Lecture 107 - Double negation - Part 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 108 - Laws of Logic
- Lecture 109 - De Morgan's Law - Part 1
- Lecture 110 - De Morgan's Law - Part 2
- Lecture 111 - Rules of Inferences - Part 1
- Lecture 112 - Rules of Inferences - Part 2
- Lecture 113 - Rules of Inferences - Part 3
- Lecture 114 - Rules of Inferences - Part 4
- Lecture 115 - Rules of Inferences - Part 5
- Lecture 116 - Rules of Inferences - Part 6
- Lecture 117 - Rules of Inferences - Part 7
- Lecture 118 - Conclusion
- Lecture 119 - Introduction to Relation
- Lecture 120 - Graphical Representation of a Relation
- Lecture 121 - Various sets
- Lecture 122 - Matrix Representation of a Relation
- Lecture 123 - Relation - An Example
- Lecture 124 - Cartesian Product
- Lecture 125 - Set Representation of a Relation
- Lecture 126 - Revisiting Representations of a Relation
- Lecture 127 - Examples of Relations
- Lecture 128 - Number of relations - Part 1
- Lecture 129 - Number of relations - Part 2
- Lecture 130 - Reflexive relation - Introduction
- Lecture 131 - Example of a Reflexive relation
- Lecture 132 - Reflexive relation - Matrix representation
- Lecture 133 - Number of Reflexive relations
- Lecture 134 - Symmetric Relation - Introduction
- Lecture 135 - Symmetric Relation - Matrix representation
- Lecture 136 - Symmetric Relation - Examples and non examples
- Lecture 137 - Parallel lines revisited
- Lecture 138 - Number of symmetric relations - Part 1
- Lecture 139 - Number of symmetric relations - Part 2
- Lecture 140 - Examples of Reflexive and Symmetric Relations
- Lecture 141 - Pattern
- Lecture 142 - Transitive relation - Examples and non examples
- Lecture 143 - Antisymmetric relation
- Lecture 144 - Examples of Transitive and Antisymmetric Relation
- Lecture 145 - Antisymmetric - Graphical representation
- Lecture 146 - Antisymmetric - Matrix representation

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 147 - Number of Antisymmetric relations
- Lecture 148 - Condition for relation to be reflexive
- Lecture 149 - Few notations
- Lecture 150 - Condition for relation to be reflexive
- Lecture 151 - Condition for relation to be reflexive
- Lecture 152 - Condition for relation to be symmetric
- Lecture 153 - Condition for relation to be symmetric
- Lecture 154 - Condition for relation to be antisymmetric
- Lecture 155 - Equivalence relation
- Lecture 156 - Equivalence relation - Example 4
- Lecture 157 - Partition - Part 1
- Lecture 158 - Partition - Part 2
- Lecture 159 - Partition - Part 3
- Lecture 160 - Partition - Part 4
- Lecture 161 - Partition - Part 5
- Lecture 162 - Partition - Part 6
- Lecture 163 - Motivational Example - 1
- Lecture 164 - Motivational Example - 2
- Lecture 165 - Commonality in examples
- Lecture 166 - Motivational Example - 3
- Lecture 167 - Example - 4 Explanation
- Lecture 168 - Introduction to functions
- Lecture 169 - Definition of a function - Part 1
- Lecture 170 - Definition of a function - Part 2
- Lecture 171 - Definition of a function - Part 3
- Lecture 172 - Relations vs Functions - Part 1
- Lecture 173 - Relations vs Functions - Part 2
- Lecture 174 - Introduction to One-One Function
- Lecture 175 - One-One Function - Example 1
- Lecture 176 - One-One Function - Example 2
- Lecture 177 - One-One Function - Example 3
- Lecture 178 - Proving a Function is One-One
- Lecture 179 - Examples and Non- examples of One-One function
- Lecture 180 - Cardinality condition in One-One function - Part 1
- Lecture 181 - Cardinality condition in One-One function - Part 2
- Lecture 182 - Introduction to Onto Function - Part 1
- Lecture 183 - Introduction to Onto Function - Part 2
- Lecture 184 - Definition of Onto Function
- Lecture 185 - Examples of Onto Function

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 186 - Cardinality condition in Onto function - Part 1
- Lecture 187 - Cardinality condition in Onto function - Part 2
- Lecture 188 - Introduction to Bijection
- Lecture 189 - Examples of Bijection
- Lecture 190 - Cardinality condition in Bijection - Part 1
- Lecture 191 - Cardinality condition in Bijection - Part 2
- Lecture 192 - Counting number of functions
- Lecture 193 - Number of functions
- Lecture 194 - Number of One-One functions - Part 1
- Lecture 195 - Number of One-One functions - Part 2
- Lecture 196 - Number of One-One functions - Part 3
- Lecture 197 - Number of Onto functions
- Lecture 198 - Number of Bijections
- Lecture 199 - Counting number of functions.
- Lecture 200 - Motivation for Composition of functions - Part 1
- Lecture 201 - Motivation for Composition of functions - Part 2
- Lecture 202 - Definition of Composition of functions
- Lecture 203 - Why study Composition of functions
- Lecture 204 - Example of Composition of functions - Part 1
- Lecture 205 - Example of Composition of functions - Part 2
- Lecture 206 - Motivation for Inverse functions
- Lecture 207 - Inverse functions
- Lecture 208 - Examples of Inverse functions
- Lecture 209 - Application of inverse functions - Part 1
- Lecture 210 - Three stories
- Lecture 211 - Three stories - Connecting the dots
- Lecture 212 - Mathematical induction - An illustration
- Lecture 213 - Mathematical Induction - Its essence
- Lecture 214 - Mathematical Induction - The formal way
- Lecture 215 - MI - Sum of odd numbers
- Lecture 216 - MI - Sum of powers of 2
- Lecture 217 - MI - Inequality 1
- Lecture 218 - MI - Inequality 1 (solution)
- Lecture 219 - MI - To prove divisibility
- Lecture 220 - MI - To prove divisibility (solution)
- Lecture 221 - MI - Problem on satisfying inequalities
- Lecture 222 - MI - Problem on satisfying inequalities (solutions)
- Lecture 223 - MI - Inequality 2
- Lecture 224 - MI - Inequality 2 solution

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- Lecture 225 - Mathematical Induction - Example 9
- Lecture 226 - Mathematical Induction - Example 10 solution
- Lecture 227 - Binomial Coefficients - Proof by induction
- Lecture 228 - Checker board and Triominoes - A puzzle
- Lecture 229 - Checker board and triominoes - Solution
- Lecture 230 - Mathematical induction - An important note
- Lecture 231 - Mathematical Induction - A false proof
- Lecture 232 - A false proof - Solution
- Lecture 233 - Motivation for Pigeonhole Principle
- Lecture 234 - Group of n people
- Lecture 235 - Set of n integers
- Lecture 236 - 10 points on an equilateral triangle
- Lecture 237 - Pigeonhole Principle - A result
- Lecture 238 - Consecutive integers
- Lecture 239 - Consecutive integers solution
- Lecture 240 - Matching initials
- Lecture 241 - Matching initials - Solution
- Lecture 242 - Numbers adding to 9
- Lecture 243 - Numbers adding to 9 - Solution
- Lecture 244 - Deck of cards
- Lecture 245 - Deck of cards - Solution
- Lecture 246 - Number of errors
- Lecture 247 - Number of errors - Solution
- Lecture 248 - Puzzle - Challenge for you
- Lecture 249 - Friendship - an interesting property
- Lecture 250 - Connectedness through Connecting people
- Lecture 251 - Traversing the bridges
- Lecture 252 - Three utilities problem
- Lecture 253 - Coloring the India map
- Lecture 254 - Definition of a Graph
- Lecture 255 - Degree and degree sequence
- Lecture 256 - Relation between number of edges and degrees
- Lecture 257 - Relation between number of edges and degrees - Proof
- Lecture 258 - Hand shaking lemma - Corollary
- Lecture 259 - Problems based on Hand shaking lemma
- Lecture 260 - Havel Hakimi theorem - Part 1
- Lecture 261 - Havel Hakimi theorem - Part 2
- Lecture 262 - Havel Hakimi theorem - Part 3
- Lecture 263 - Havel Hakimi theorem - Part 4

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 264 - Havel Hakimi theorem - Part 5
- Lecture 265 - Regular graph and irregular graph
- Lecture 266 - Walk
- Lecture 267 - Trail
- Lecture 268 - Path and closed path
- Lecture 269 - Definitions revisited
- Lecture 270 - Examples of walk, trail and path
- Lecture 271 - Cycle and circuit
- Lecture 272 - Example of cycle and circuit
- Lecture 273 - Relation between walk and path
- Lecture 274 - Relation between walk and path - An induction proof
- Lecture 275 - Subgraph
- Lecture 276 - Spanning and induced subgraph
- Lecture 277 - Spanning and induced subgraph - A result
- Lecture 278 - Introduction to Tree
- Lecture 279 - Connected and Disconnected graphs
- Lecture 280 - Property of a cycle
- Lecture 281 - Edge condition for connectivity
- Lecture 282 - Connecting connectedness and path
- Lecture 283 - Connecting connectedness and path - An illustration
- Lecture 284 - Cut vertex
- Lecture 285 - Cut edge
- Lecture 286 - Illustration of cut vertices and cut edges
- Lecture 287 - NetworkX - Need of the hour
- Lecture 288 - Introduction to Python - Installation
- Lecture 289 - Introduction to Python - Basics
- Lecture 290 - Introduction to NetworkX
- Lecture 291 - Story so far - Using NetworkX
- Lecture 292 - Directed, weighted and multi graphs
- Lecture 293 - Illustration of Directed, weighted and multi graphs
- Lecture 294 - Graph representations - Introduction
- Lecture 295 - Adjacency matrix representation
- Lecture 296 - Incidence matrix representation
- Lecture 297 - Isomorphism - Introduction
- Lecture 298 - Isomorphic graphs - An illustration
- Lecture 299 - Isomorphic graphs - A challenge
- Lecture 300 - Non-isomorphic graphs
- Lecture 301 - Isomorphism - A question
- Lecture 302 - Complement of a Graph - Introduction

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 303 - Complement of a Graph - Illiustration
- Lecture 304 - Self complement
- Lecture 305 - Complement of a disconnected graph is connected
- Lecture 306 - Complement of a disconnected graph is connected - Solution
- Lecture 307 - Which is more? Connected graphs or disconnected graphs?
- Lecture 308 - Bipartite graphs.
- Lecture 309 - Bipartite graphs
- Lecture 310 - Bipartite graphs - A puzzle
- Lecture 311 - Bipartite graphs - Converse part of the puzzle
- Lecture 312 - Definition of Eulerian Graph
- Lecture 313 - Illustration of eulerian graph
- Lecture 314 - Non- example of Eulerian graph
- Lecture 315 - Litmus test for an Eulerian graph
- Lecture 316 - Why even degree?
- Lecture 317 - Proof for even degree implies graph is eulerian
- Lecture 318 - A condition for Eulerian trail
- Lecture 319 - Why the name Eulerian
- Lecture 320 - Can you traverse all location?
- Lecture 321 - Defintion of Hamiltonian graphs
- Lecture 322 - Examples of Hamiltonian graphs
- Lecture 323 - Hamiltonian graph - A result
- Lecture 324 - A result on connectedness
- Lecture 325 - A result on Path
- Lecture 326 - Dirac's Theorem
- Lecture 327 - Dirac's theorem - A note
- Lecture 328 - Ore's Theorem
- Lecture 329 - Dirac's Theorem v/s Ore's Theorem
- Lecture 330 - Eulerian and Hamiltonian Are they related
- Lecture 331 - Importance of Hamiltonian graphs in Computer science
- Lecture 332 - Constructing non intersecting roads
- Lecture 333 - Definition of a Planar graph
- Lecture 334 - Examples of Planar graphs
- Lecture 335 -  $V - E + R = 2$
- Lecture 336 - Illustration of  $V - E + R = 2$
- Lecture 337 -  $V - E + R = 2$ ; Use induction
- Lecture 338 - Proof of  $V - E + R = 2$
- Lecture 339 - Famous non-planar graphs
- Lecture 340 - Litmus test for planarity
- Lecture 341 - Planar graphs - Inequality 1

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- Lecture 342 - 3 Utilities problem - Revisited
- Lecture 343 - Complete graph on 5 vertices is non-planar - Proof
- Lecture 344 - Prisoners and cells
- Lecture 345 - Prisoners example and Proper coloring
- Lecture 346 - Chromatic number of a graph
- Lecture 347 - Examples on Proper coloring
- Lecture 348 - Recalling the India map problem
- Lecture 349 - Recalling the India map problem - Solution
- Lecture 350 - NetworkX - Digraphs
- Lecture 351 - NetworkX - Adjacency matrix
- Lecture 352 - NetworkX - Random graphs
- Lecture 353 - NetworkX - Subgraph
- Lecture 354 - NetworkX - Isomorphic graphs Part 1
- Lecture 355 - NetworkX - Isomorphic graphs Part 2
- Lecture 356 - NetworkX - Isomorphic graphs
- Lecture 357 - NetworkX - Graph complement
- Lecture 358 - NetworkX - Eulerian graphs
- Lecture 359 - NetworkX - Bipartite graphs
- Lecture 360 - NetworkX - Coloring
- Lecture 361 - Counting in a creative way
- Lecture 362 - Example 1 - Fun with words
- Lecture 363 - Words and the polynomial
- Lecture 364 - Words and the polynomial - Explained
- Lecture 365 - Example 2 - Picking five balls
- Lecture 366 - Picking five balls - Solution
- Lecture 367 - Picking five balls - Another version
- Lecture 368 - Definition of Generating function
- Lecture 369 - Generating function examples - Part 1
- Lecture 370 - Generating function examples - Part 2
- Lecture 371 - Generating function examples - Part 3
- Lecture 372 - Binomial expansion - A generating function
- Lecture 373 - Binomial expansion - Explained
- Lecture 374 - Picking 7 balls - The naive way
- Lecture 375 - Picking 7 balls - The creative way
- Lecture 376 - Generating functions - Problem 1
- Lecture 377 - Generating functions - Problem 2
- Lecture 378 - Generating functions - Problem 3
- Lecture 379 - Why Generating function?
- Lecture 380 - Introduction to Advanced Counting

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 381 - Example 1  
Lecture 382 - Inclusion-Exclusion Formula  
Lecture 383 - Proof of Inclusion - Exclusion formula  
Lecture 384 - Example 2  
Lecture 385 - Example 3  
Lecture 386 - Example 4  
Lecture 387 - Example 5  
Lecture 388 - Example 6  
Lecture 389 - A tip in solving problems  
Lecture 390 - Example 7  
Lecture 391 - Example 8  
Lecture 392 - Example 10  
Lecture 393 - Example 11  
Lecture 394 - Example 11  
Lecture 395 - Example 12  
Lecture 396 - Number of Onto Functions.  
Lecture 397 - Formula for Number of Onto Functions  
Lecture 398 - Example 13  
Lecture 399 - Example 14  
Lecture 400 - Derangements  
Lecture 401 - Derangements of 4 numbers  
Lecture 402 - Example 15  
Lecture 403 - Example 16  
Lecture 404 - Example 17  
Lecture 405 - Example 18  
Lecture 406 - Example 19  
Lecture 407 - Placing rooks on the chessboard  
Lecture 408 - Rook Polynomial  
Lecture 409 - Rook Polynomial  
Lecture 410 - Motivation for recurrence relation  
Lecture 411 - Getting started with recurrence relations  
Lecture 412 - What is a recurrence relation?  
Lecture 413 - Compound Interest as a recurrence relation  
Lecture 414 - Examples of recurrence relations  
Lecture 415 - Example - Number of ways of climbing steps  
Lecture 416 - Number of ways of climbing steps  
Lecture 417 - Example - Rabbits on an island  
Lecture 418 - Example - n-bit string  
Lecture 419 - Example - n-bit string without consecutive zero

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 420 - Solving Linear Recurrence Relations - A theorem
- Lecture 421 - A note on the proof
- Lecture 422 - Solving recurrence relation - Example 1
- Lecture 423 - Solving recurrence relation - Example 2
- Lecture 424 - Fibonacci Sequence
- Lecture 425 - Introduction to Fibonacci sequence
- Lecture 426 - Solution of Fibonacci sequence
- Lecture 427 - A basic introduction to 'complexity'
- Lecture 428 - Intuition for 'complexity'
- Lecture 429 - Visualizing complexity order as a graph
- Lecture 430 - Tower of Hanoi
- Lecture 431 - Recurrence relation of Tower of Hanoi
- Lecture 432 - Solution for the recurrence relation of Tower of Hanoi
- Lecture 433 - A searching technique
- Lecture 434 - Recurrence relation for Binary search
- Lecture 435 - Solution for the recurrence relation of Binary search
- Lecture 436 - Example
- Lecture 437 - Example
- Lecture 438 - Door knock example and Merge sort
- Lecture 439 - Introduction to Merge sort - 1
- Lecture 440 - Recurrence relation for Merge sort
- Lecture 441 - Introduction to advanced topics
- Lecture 442 - Introduction to Chromatic polynomial
- Lecture 443 - Chromatic polynomial of complete graphs
- Lecture 444 - Chromatic polynomial of cycle on 4 vertices - Part 1
- Lecture 445 - Chromatic polynomial of cycle on 4 vertices - Part 2
- Lecture 446 - Correspondence between partition and generating functions
- Lecture 447 - Correspondence between partition and generating functions
- Lecture 448 - Distinct partitions and odd partitions
- Lecture 449 - Distinct partitions and generating functions
- Lecture 450 - Odd partitions and generating functions
- Lecture 451 - Distinct partitions equals odd partitions
- Lecture 452 - Distinct partitions equals odd partitions
- Lecture 453 - Why 'partitions' to 'polynomial'?
- Lecture 454 - Example
- Lecture 455 - Motivation for exponential generating function
- Lecture 456 - Recurrence relation
- Lecture 457 - Introduction to Group Theory
- Lecture 458 - Uniqueness of the identity element

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 459 - Formal definition of a Group
- Lecture 460 - Groups
- Lecture 461 - Groups
- Lecture 462 - Groups
- Lecture 463 - Subgroup
- Lecture 464 - Lagrange's theorem
- Lecture 465 - Summary
- Lecture 466 - Conclusion

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Deep Learning

Subject Co-ordinator - Prof.Mitesh Khapra

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Biological Neuron
- Lecture 2 - From Spring to Winter of AI
- Lecture 3 - The Deep Revival
- Lecture 4 - From Cats to Convolutional Neural Networks
- Lecture 5 - Faster, higher, stronger
- Lecture 6 - The Curious Case of Sequences
- Lecture 7 - Beating humans at their own games (literally)
- Lecture 8 - The Madness (2013)
- Lecture 9 - (Need for) Sanity
- Lecture 10 - Motivation from Biological Neurons
- Lecture 11 - McCulloch Pitts Neuron, Thresholding Logic
- Lecture 12 - Perceptrons
- Lecture 13 - Error and Error Surfaces
- Lecture 14 - Perceptron Learning Algorithm
- Lecture 15 - Proof of Convergence of Perceptron Learning Algorithm
- Lecture 16 - Deep Learning (CS7015)
- Lecture 17 - Deep Learning (CS7015)
- Lecture 18 - Deep Learning (CS7015)
- Lecture 19 - Deep Learning (CS7015)
- Lecture 20 - Deep Learning (CS7015)
- Lecture 21 - Deep Learning (CS7015)
- Lecture 22 - Deep Learning (CS7015)
- Lecture 23 - Feedforward Neural Networks (a.k.a multilayered network of neurons)
- Lecture 24 - Learning Parameters of Feedforward Neural Networks (Intuition)
- Lecture 25 - Output functions and Loss functions
- Lecture 26 - Backpropagation (Intuition)
- Lecture 27 - Backpropagation
- Lecture 28 - Backpropagation
- Lecture 29 - Backpropagation

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Backpropagation
- Lecture 31 - Derivative of the activation function
- Lecture 32 - Information content, Entropy and cross entropy
- Lecture 33 - Recap
- Lecture 34 - Contours Maps
- Lecture 35 - Momentum based Gradient Descent
- Lecture 36 - Nesterov Accelerated Gradient Descent
- Lecture 37 - Stochastic And Mini-Batch Gradient Descent
- Lecture 38 - Tips for Adjusting Learning Rate and Momentum
- Lecture 39 - Line Search
- Lecture 40 - Gradient Descent with Adaptive Learning Rate
- Lecture 41 - Bias Correction in Adam
- Lecture 42 - Eigenvalues and Eigenvectors
- Lecture 43 - Linear Algebra
- Lecture 44 - Eigenvalue Decomposition
- Lecture 45 - Principal Component Analysis and its Interpretations
- Lecture 46 - PCA
- Lecture 47 - PCA
- Lecture 48 - PCA
- Lecture 49 - PCA
- Lecture 50 - Singular Value Decomposition
- Lecture 51 - Introduction to Autoencoders
- Lecture 52 - Link between PCA and Autoencoders
- Lecture 53 - Regularization in autoencoders (Motivation)
- Lecture 54 - Denoising Autoencoders
- Lecture 55 - Sparse Autoencoders
- Lecture 56 - Contractive Autoencoders
- Lecture 57 - Bias and Variance
- Lecture 58 - Train error vs Test error
- Lecture 59 - Train error vs Test error (Recap)
- Lecture 60 - True error and Model complexity
- Lecture 61 - L2 regularization
- Lecture 62 - Dataset augmentation
- Lecture 63 - Parameter sharing and tying
- Lecture 64 - Adding Noise to the inputs
- Lecture 65 - Adding Noise to the outputs
- Lecture 66 - Early stopping
- Lecture 67 - Ensemble Methods
- Lecture 68 - Dropout

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - A quick recap of training deep neural networks
- Lecture 70 - Unsupervised pre-training
- Lecture 71 - Better activation functions
- Lecture 72 - Better initialization strategies
- Lecture 73 - Batch Normalization
- Lecture 74 - One-hot representations of words
- Lecture 75 - Distributed Representations of words
- Lecture 76 - SVD for learning word representations
- Lecture 77 - SVD for learning word representations (Continued...)
- Lecture 78 - Continuous bag of words model
- Lecture 79 - Skip-gram model
- Lecture 80 - Skip-gram model (Continued...)
- Lecture 81 - Contrastive estimation
- Lecture 82 - Hierarchical softmax
- Lecture 83 - GloVe representations
- Lecture 84 - Evaluating word representations
- Lecture 85 - Relation between SVD and Word2Vec
- Lecture 86 - The convolution operation
- Lecture 87 - Relation between input size, output size and filter size
- Lecture 88 - Convolutional Neural Networks
- Lecture 89 - Convolutional Neural Networks (Continued...)
- Lecture 90 - CNNs (success stories on ImageNet)
- Lecture 91 - CNNs (success stories on ImageNet) (Continued...)
- Lecture 92 - Image Classification continued (GoogLeNet and ResNet)
- Lecture 93 - Visualizing patches which maximally activate a neuron
- Lecture 94 - Visualizing filters of a CNN
- Lecture 95 - Occlusion experiments
- Lecture 96 - Finding influence of input pixels using backpropagation
- Lecture 97 - Guided Backpropagation
- Lecture 98 - Optimization over images
- Lecture 99 - Create images from embeddings
- Lecture 100 - Deep Dream
- Lecture 101 - Deep Art
- Lecture 102 - Fooling Deep Convolutional Neural Networks
- Lecture 103 - Sequence Learning Problems
- Lecture 104 - Recurrent Neural Networks
- Lecture 105 - Backpropagation through time
- Lecture 106 - The problem of Exploding and Vanishing Gradients
- Lecture 107 - Some Gory Details

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 108 - Selective Read, Selective Write, Selective Forget - The Whiteboard Analogy
- Lecture 109 - Long Short Term Memory (LSTM) and Gated Recurrent Units (GRUs)
- Lecture 110 - How LSTMs avoid the problem of vanishing gradients
- Lecture 111 - How LSTMs avoid the problem of vanishing gradients (Continued...)
- Lecture 112 - Introduction to Encoder Decoder Models
- Lecture 113 - Applications of Encoder Decoder models
- Lecture 114 - Attention Mechanism
- Lecture 115 - Attention Mechanism (Continued...)
- Lecture 116 - Attention over images
- Lecture 117 - Hierarchical Attention

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Foundations to Computer Systems Design

Subject Co-ordinator - Prof. V. Kamakoti

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to the Course  
Lecture 2 - CMOS Transistors and Gates  
Lecture 3 - Basic Gates  
Lecture 4 - Building Gates Using Simulator  
Lecture 5 - Hierarchical Design and Verification  
Lecture 6 - Building Blocks of a Digital Computer  
Lecture 7 - Binary Number Systems  
Lecture 8 - Signed Number Systems  
Lecture 9 - Twos Complement Number System  
Lecture 10 - Binary Adder Circuits  
Lecture 11 - Building the ALU of HACK  
Lecture 12 - HACK ALU Functionality  
Lecture 13 - Tips for Project P1  
Lecture 14 - Sequential Logic Design  
Lecture 15 - Latches and Flipflops  
Lecture 16 - The Memory Hierarchy  
Lecture 17 - Design of Program Counter  
Lecture 18 - Introduction to Computer Organization  
Lecture 19 - Memory Mapped I/O  
Lecture 20 - Tips for Projects P2 and P3  
Lecture 21 - Tips for Project 4  
Lecture 22 - Tips for Project 4  
Lecture 23 - Introduction to Computer Architecture  
Lecture 24 - The HACK Microarchitecture  
Lecture 25 - The HACK CPU - A Deep Dive - Part 1  
Lecture 26 - The HACK CPU - A Deep Dive - Part 2  
Lecture 27 - The Data Memory  
Lecture 28 - The HACK Computer  
Lecture 29 - The Assembler Construction

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- Lecture 30 - Understanding the Working of Assembler
- Lecture 31 - Assembler
- Lecture 32 - Assembler
- Lecture 33 - Assembler
- Lecture 34 - Project 6
- Lecture 35 - Virtual Machines - What and Why?
- Lecture 36 - The VM Instruction Set Architecture
- Lecture 37 - The execution of a VM Program
- Lecture 38 - How powerful is the VM?
- Lecture 39 - Project 7
- Lecture 40 - Project 7
- Lecture 41 - Deep Understanding of VM ISA using VM Emulator
- Lecture 42 - Virtual Machine II - Program flow commands and Introduction to Function Calls
- Lecture 43 - Implementation of Function Call
- Lecture 44 - Working of the Virtual Machine
- Lecture 45 - Project 8
- Lecture 46 - Handling Static Variables
- Lecture 47 - Project 8
- Lecture 48 - Introduction to The JACK Programming Language
- Lecture 49 - Project 9
- Lecture 50 - Understanding Syntax of JACK using Examples
- Lecture 51 - Project 9
- Lecture 52 - The JACK Syntax - Language Specification
- Lecture 53 - Application Development using JACK
- Lecture 54 - JACK Compiler
- Lecture 55 - Project 10
- Lecture 56 - The JACK Grammar
- Lecture 57 - Compiler for JACK
- Lecture 58 - The Token Analyzer
- Lecture 59 - Testing the Correctness
- Lecture 60 - The Jack Compiler - Back-end Introduction
- Lecture 61 - The Jack Compiler - Handling Variables
- Lecture 62 - The Jack Compiler - Handling Expressions
- Lecture 63 - The Jack Compiler - Handling Flow of Control
- Lecture 64 - The Jack Compiler - Handling Objects
- Lecture 65 - The Jack Compiler - Handling Arrays
- Lecture 66 - The Jack Compiler Backend
- Lecture 67 - The Jack Compiler Backend
- Lecture 68 - The Jack Compiler Backend

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- Lecture 69 - The Jack Compiler Backend
- Lecture 70 - The Jack Compiler Backend
- Lecture 71 - The Jack Compiler Backend
- Lecture 72 - Jack Compiler
- Lecture 73 - Jack Compiler
- Lecture 74 - Jack Compiler
- Lecture 75 - Understand the Operating System - Compiler Interactions
- Lecture 76 - Project 12 - One sample journey from Jack to Hack
- Lecture 77 - Concluding Remarks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Machine Learning for Engineering and Science Appl

Subject Co-ordinator - Prof. Ganapathy, Prof. Balaji Srinivasan

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to the Course History of Artificial Intelligence
- Lecture 2 - Overview of Machine Learning
- Lecture 3 - Why Linear Algebra ? Scalars, Vectors, Tensors
- Lecture 4 - Basic Operations
- Lecture 5 - Norms
- Lecture 6 - Linear Combinations Span Linear Independence
- Lecture 7 - Matrix Operations Special Matrices Matrix Decompositions
- Lecture 8 - Introduction to Probability Theory Discrete and Continuous Random Variables
- Lecture 9 - Conditional, Joint, Marginal Probabilities Sum Rule and Product Rule Bayes' Theorem
- Lecture 10 - Bayes' Theorem - Simple Examples
- Lecture 11 - Independence Conditional Independence Chain Rule Of Probability
- Lecture 12 - Expectation
- Lecture 13 - Variance Covariance
- Lecture 14 - Some Relations for Expectation and Covariance (Slightly Advanced)
- Lecture 15 - Machine Representation of Numbers, Overflow, Underflow, Condition Number
- Lecture 16 - Derivatives, Gradient, Hessian, Jacobian, Taylor Series
- Lecture 17 - Matrix Calculus (Slightly Advanced)
- Lecture 18 - Optimization 1 Unconstrained Optimization
- Lecture 19 - Introduction to Constrained Optimization
- Lecture 20 - Introduction to Numerical Optimization Gradient Descent - 1
- Lecture 21 - Gradient Descent 2 Proof of Steepest Descent Numerical Gradient Calculation Stopping Criteria
- Lecture 22 - Introduction to Packages
- Lecture 23 - The Learning Paradigm
- Lecture 24 - A Linear Regression Example
- Lecture 25 - Linear Regression Least Squares Gradient Descent
- Lecture 26 - Coding Linear Regression
- Lecture 27 - Generalized Function for Linear Regression
- Lecture 28 - Goodness of Fit
- Lecture 29 - Bias-Variance Trade Off

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- Lecture 30 - Gradient Descent Algorithms
- Lecture 31 - Introduction to Week 5 (Deep Learning)
- Lecture 32 - Logistic Regression
- Lecture 33 - Binary Entropy cost function
- Lecture 34 - OR Gate Via Classification
- Lecture 35 - NOR, AND, NAND Gates
- Lecture 36 - XOR Gate
- Lecture 37 - Differentiating the sigmoid
- Lecture 38 - Gradient of logistic regression
- Lecture 39 - Code for Logistic Regression
- Lecture 40 - Multinomial Classification - Introduction
- Lecture 41 - Multinomial Classification - One Hot Vector
- Lecture 42 - Multinomial Classification - Softmax
- Lecture 43 - Schematic of multinomial logistic regression
- Lecture 44 - Biological neuron
- Lecture 45 - Structure of an Artificial Neuron
- Lecture 46 - Feedforward Neural Network
- Lecture 47 - Introduction to back prop
- Lecture 48 - Summary of Week 05
- Lecture 49 - Introduction to Convolution Neural Networks (CNN)
- Lecture 50 - Types of convolution
- Lecture 51 - CNN Architecture Part 1 (LeNet and Alex Net)
- Lecture 52 - CNN Architecture Part 2 (VGG Net)
- Lecture 53 - CNN Architecture Part 3 (GoogleNet)
- Lecture 54 - CNN Architecture Part 4 (ResNet)
- Lecture 55 - CNN Architecture Part 5 (DenseNet)
- Lecture 56 - Train Network for Image Classification
- Lecture 57 - Semantic Segmentation
- Lecture 58 - Hyperparameter optimization
- Lecture 59 - Transfer Learning
- Lecture 60 - Segmentation of Brain Tumors from MRI using Deep Learning
- Lecture 61 - Activation Functions
- Lecture 62 - Learning Rate decay, Weight initialization
- Lecture 63 - Data Normalization
- Lecture 64 - Batch Norm
- Lecture 65 - Introduction to RNNs
- Lecture 66 - Example - Sequence Classification
- Lecture 67 - Training RNNs - Loss and BPTT
- Lecture 68 - Vanishing Gradients and TBPTT

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - RNN Architectures
- Lecture 70 - LSTM
- Lecture 71 - Why LSTM Works
- Lecture 72 - Deep RNNs and Bi- RNNs
- Lecture 73 - Summary of RNNs
- Lecture 74 - Introduction.
- Lecture 75 - Knn
- Lecture 76 - Binary decision trees
- Lecture 77 - Binary regression trees
- Lecture 78 - Bagging
- Lecture 79 - Random Forest
- Lecture 80 - Boosting
- Lecture 81 - Gradient boosting
- Lecture 82 - Unsupervised learning and Kmeans
- Lecture 83 - Agglomerative clustering
- Lecture 84 - Probability Distributions- Gaussian, Bernoulli
- Lecture 85 - Covariance Matrix of Gaussian Distribution
- Lecture 86 - Central Limit Theorem
- Lecture 87 - Naïve Bayes
- Lecture 88 - MLE Intro
- Lecture 89 - PCA - Part 1
- Lecture 90 - PCA - Part 2
- Lecture 91 - Support Vector Machines
- Lecture 92 - MLE, MAP and Bayesian Regression
- Lecture 93 - Introduction to Generative model
- Lecture 94 - Generative Adversarial Networks (GAN)
- Lecture 95 - Variational Auto-encoders (VAE)
- Lecture 96 - Applications
- Lecture 97 - Applications
- Lecture 98 - Introduction to Week 12
- Lecture 99 - Application 1 description - Fin Heat Transfer
- Lecture 100 - Application 1 solution
- Lecture 101 - Application 2 description - Computational Fluid Dynamics
- Lecture 102 - Application 2 solution
- Lecture 103 - Application 3 description - Topology Optimization
- Lecture 104 - Application 3 solution
- Lecture 105 - Application 4 Solution of PDE/ODE using Neural Networks
- Lecture 106 - Summary and road ahead

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Information Security 5 - Secure Systems Engineering

Subject Co-ordinator - Prof. Chester Rebeiro

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Secure Systems Engineering
- Lecture 2 - Program Binaries
- Lecture 3 - Buffer Overflows in the Stack
- Lecture 4 - Buffer Overflows
- Lecture 5 - Gdb - Demo
- Lecture 6 - Skip instruction - Demo
- Lecture 7 - Buffer Overflow - Demo
- Lecture 8 - Buffer Overflow (create a shell) - Demo
- Lecture 9 - Preventing buffer overflows with canaries and W^X
- Lecture 10 - Return-to-libc attack
- Lecture 11 - ROP Attacks
- Lecture 12 - Demonstration of Canaries, W^X, and ASLR to prevent Buffer Overflow Attacks
- Lecture 13 - Demonstration of a Return-to-Libc Attack
- Lecture 14 - Demonstration of a Return Oriented Programming (ROP) Attack
- Lecture 15 - ASLR - Part 1
- Lecture 16 - ASLR - Part 2
- Lecture 17 - Buffer overreads
- Lecture 18 - Demonstration of Load Time Relocation
- Lecture 19 - Demonstration of Position Independent Code
- Lecture 20 - PLT Demonstration
- Lecture 21 - Format string vulnerabilities
- Lecture 22 - Integer Vulnerabilities
- Lecture 23 - Heap
- Lecture 24 - Heap exploits
- Lecture 25 - Demo of Integer Vulnerabilities - I
- Lecture 26 - Demo of Integer Vulnerabilities - II
- Lecture 27 - Demo of Format String Vulnerabilities
- Lecture 28 - Access Control
- Lecture 29 - Access control in linux

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Mandatory access Control
- Lecture 31 - Confinement in Applications
- Lecture 32 - Software fault isolation
- Lecture 33 - Trusted Execution Environments
- Lecture 34 - ARM Trustzone
- Lecture 35 - SGX - Part 1
- Lecture 36 - SGX - Part 2
- Lecture 37 - PUF - Part 1
- Lecture 38 - PUF - Part 2
- Lecture 39 - PUF - Part 3
- Lecture 40 - Covert Channels
- Lecture 41 - Flush+Reload Attacks
- Lecture 42 - Prime+Probe
- Lecture 43 - Meltdown
- Lecture 44 - Spectre Variant - 1
- Lecture 45 - Spectre variant - 2
- Lecture 46 - rowhammer
- Lecture 47 - Heap demo - 1
- Lecture 48 - Heap demo - 2
- Lecture 49 - Heap demo - 3
- Lecture 50 - PowerAnalysisAttacks
- Lecture 51 - Hardware Trojans
- Lecture 52 - FANCI
- Lecture 53 - Detecting Hardware Trojans in ICs
- Lecture 54 - Protecting against Hardware Trojans
- Lecture 55 - Side Channel Analysis
- Lecture 56 - Fault Attacks on AES
- Lecture 57 - Demo
- Lecture 58 - Demo
- Lecture 59 - Demo

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Multimodal Interaction

Subject Co-ordinator - Dr. Stefan Hillmann, Prof. Dr. Sebastian Moller

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - Medium vs. Modality  
Lecture 3 - Multimedia and Multimodality  
Lecture 4 - Modality Relations  
Lecture 5 - Characteristics of Multimodal Systems  
Lecture 6 - Introduction  
Lecture 7 - Speech Production  
Lecture 8 - Hearing - Ear  
Lecture 9 - Hearing - Perception  
Lecture 10 - Introduction  
Lecture 11 - The Human Eye  
Lecture 12 - Gestalt Perception  
Lecture 13 - Resolution and Sensitivity  
Lecture 14 - Depth Perception  
Lecture 15 - Reading  
Lecture 16 - Introduction  
Lecture 17 - Haptics  
Lecture 18 - Smell  
Lecture 19 - Taste  
Lecture 20 - Memory  
Lecture 21 - Motorsystem  
Lecture 22 - Introduction  
Lecture 23 - Processing Multiple Signals  
Lecture 24 - Multimodal Dual-Tasks  
Lecture 25 - Effects of Discongruent Signals  
Lecture 26 - Relevance  
Lecture 27 - Introduction 1  
Lecture 28 - Introduction 2  
Lecture 29 - Gesture to Space

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Turn Taking
- Lecture 31 - Conclusion
- Lecture 32 - Introduction
- Lecture 33 - Overview
- Lecture 34 - Automatic Speech Recognition
- Lecture 35 - Emotion Recognition
- Lecture 36 - Text Recognition
- Lecture 37 - Introduction1
- Lecture 38 - Icons
- Lecture 39 - Text Generation
- Lecture 40 - Text to Speech
- Lecture 41 - Speech Generation
- Lecture 42 - Introduction .
- Lecture 43 - Multimodal Interactive Systems Development
- Lecture 44 - Introduction . .
- Lecture 45 - Virtual Reality
- Lecture 46 - Introduction to Audio for Virtual Reality
- Lecture 47 - Spatial Hearing
- Lecture 48 - Dummy Heads
- Lecture 49 - Individuality of HRTFs
- Lecture 50 - Sterophony
- Lecture 51 - Crosstalk Cancelation
- Lecture 52 - Ambisonics
- Lecture 53 - Sound Field Synthesis
- Lecture 54 - Challenges with Projection-based Systems
- Lecture 55 - Capturing of Sound Scenes
- Lecture 56 - Closing Remarks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Deep Learning - Part 2

Subject Co-ordinator - Prof.Mitesh Khapra

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Recap of Probability Theory
- Lecture 2 - Why are we interested in Joint Distributions
- Lecture 3 - How do we represent a joint distribution
- Lecture 4 - Can we represent the joint distribution more compactly
- Lecture 5 - Can we use a graph to represent a joint distribution
- Lecture 6 - Different types of reasoning encoded in a Bayesian Network
- Lecture 7 - Independencies encoded by a Bayesian Network (Case 1)
- Lecture 8 - Independencies encoded by a Bayesian Network (Case 2)
- Lecture 9 - Independencies encoded by a Bayesian Network (Case 3)
- Lecture 10 - Bayesian Networks
- Lecture 11 - I-Maps
- Lecture 12 - Markov Networks
- Lecture 13 - Factors in Markov Network
- Lecture 14 - Local Independencies in a Markov Network
- Lecture 15 - Joint Distributions
- Lecture 16 - The concept of a latent variable
- Lecture 17 - Restricted Boltzmann Machines
- Lecture 18 - RBMs as Stochastic Neural Networks
- Lecture 19 - Unsupervised Learning with RBMs
- Lecture 20 - Computing the gradient of the log likelihood
- Lecture 21 - Motivation for Sampling
- Lecture 22 - Motivation for Sampling - Part 2
- Lecture 23 - Markov Chains
- Lecture 24 - Why de we care about Markov Chains ?
- Lecture 25 - Setting up a Markov Chain for RBMs
- Lecture 26 - Training RBMs Using Gibbs Sampling
- Lecture 27 - Training RBMS Using Contrastive Divergence
- Lecture 28 - Revisiting Autoencoders
- Lecture 29 - Variational Autoencoders

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Variational Autoencoders
- Lecture 31 - Neural Autoregressive Density Estimator
- Lecture 32 - Masked Autoencoder Density Estimator (MADE)
- Lecture 33 - Generative Adversarial Networks - The Intuition
- Lecture 34 - Generative Adversarial Networks - Architecture
- Lecture 35 - Generative Adversarial Networks - The Math Behind it
- Lecture 36 - Generative Adversarial Networks - Some Cool Stuff and Applications
- Lecture 37 - Bringing it all together (the deep generative summary)

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Machine Learning

Subject Co-ordinator - Prof. Henrik Bostrom, Prof. Fredrik Kilander, Prof. Carl Gustaf Jansson

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to the Machine Learning Course
- Lecture 2 - Foundation of Artificial Intelligence and Machine Learning
- Lecture 3 - Intelligent Autonomous Systems and Artificial Intelligence
- Lecture 4 - Applications of Machine Learning
- Lecture 5 - Tutorial for week 1
- Lecture 6 - Characterization of Learning Problems
- Lecture 7 - Objects, Categories and Features
- Lecture 8 - Feature related issues
- Lecture 9 - Scenarios for Concept Learning
- Lecture 10 - Tutorial for week 2
- Lecture 11 - Forms of Representation
- Lecture 12 - Decision Trees
- Lecture 13 - Bayes (ian) Belief Networks
- Lecture 14 - Artificial Neural Networks
- Lecture 15 - Genetic algorithm
- Lecture 16 - Logic Programming
- Lecture 17 - Tutorial for week 3
- Lecture 18 - Inductive Learning based on Symbolic Representations and Weak Theories
- Lecture 19 - Generalization as Search - Part 1
- Lecture 20 - Generalization as Search - Part 2
- Lecture 21 - Decision Tree Learning Algorithms - Part 1
- Lecture 22 - Decision Tree Learning Algorithms - Part 2
- Lecture 23 - Instance Based Learning - Part 1
- Lecture 24 - Instance Based Learning - Part 2
- Lecture 25 - Cluster Analysis
- Lecture 26 - Tutorial for week 4
- Lecture 27 - Machine Learning enabled by Prior Theories
- Lecture 28 - Explanation Based Learning
- Lecture 29 - Inductive Logic Programming

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Reinforcement Learning - Part 1 Introduction
- Lecture 31 - Reinforcement Learning - Part 2 Learning Algorithms
- Lecture 32 - Reinforcement Learning - Part 3 Q-Learning
- Lecture 33 - Case - Based Reasoning
- Lecture 34 - Tutorial for week 5
- Lecture 35 - Fundamentals of Artificial Neural Networks - Part 1
- Lecture 36 - Fundamentals of Artificial Neural Networks - Part 2
- Lecture 37 - Perceptrons
- Lecture 38 - Model of Neuron in an ANN
- Lecture 39 - Learning in a Feed Forward Multiple Layer ANN - Backpropagation
- Lecture 40 - Recurrent Neural Networks
- Lecture 41 - Hebbian Learning and Associative Memory
- Lecture 42 - Hopfield Networks and Boltzman Machines - Part 1
- Lecture 43 - Hopfield Networks and Boltzman Machines - Part 2
- Lecture 44 - Convolutional Neural Networks - Part 1
- Lecture 45 - Convolutional Neural Networks - Part 2
- Lecture 46 - DeepLearning
- Lecture 47 - Tutorial for week 6
- Lecture 48 - Tools and Resources
- Lecture 49 - Interdisciplinary Inspiration
- Lecture 50 - Preparation for Exam and Example of Applications

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:C Programming and Assembly Language

Subject Co-ordinator - Prof. Janakiraman Viraraghavan

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1  
Lecture 2  
Lecture 3  
Lecture 4  
Lecture 5  
Lecture 6  
Lecture 7  
Lecture 8  
Lecture 9  
Lecture 10  
Lecture 11  
Lecture 12  
Lecture 13  
Lecture 14  
Lecture 15  
Lecture 16  
Lecture 17  
Lecture 18  
Lecture 19  
Lecture 20  
Lecture 21  
Lecture 22

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Applied Natural Language Processing

Subject Co-ordinator - Prof. Ramaseshan R

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Operations on a Corpus
- Lecture 3 - Probability and NLP
- Lecture 4 - Vector Space models
- Lecture 5 - Sequence Learning
- Lecture 6 - Machine Translation
- Lecture 7 - Preprocessing
- Lecture 8 - Statistical Properties of Words - Part 1
- Lecture 9 - Statistical Properties of Words - Part 2
- Lecture 10 - Statistical Properties of Words - Part 3
- Lecture 11 - Vector Space Models for NLP
- Lecture 12 - Document Similarity - Demo, Inverted index, Exercise
- Lecture 13 - Vector Representation of words
- Lecture 14 - Contextual understanding of text
- Lecture 15 - Co-occurrence matrix, n-grams
- Lecture 16 - Collocations, Dense word Vectors
- Lecture 17 - SVD, Dimensionality reduction, Demo
- Lecture 18 - Query Processing
- Lecture 19 - Topic Modeling
- Lecture 20 - Examples for word prediction
- Lecture 21 - Introduction to Probability in the context of NLP
- Lecture 22 - Joint and conditional probabilities, independence with examples
- Lecture 23 - The definition of probabilistic language model
- Lecture 24 - Chain rule and Markov assumption
- Lecture 25 - Generative Models
- Lecture 26 - Bigram and Trigram Language models - peeking inside the model building
- Lecture 27 - Out of vocabulary words and curse of dimensionality
- Lecture 28 - Exercise
- Lecture 29 - Naive-Bayes, classification

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Machine learning, perceptron, linearly separable
- Lecture 31 - Linear Models for Claassification
- Lecture 32 - Biological Neural Network
- Lecture 33 - Perceptron
- Lecture 34 - Perceptron Learning
- Lecture 35 - Logical XOR
- Lecture 36 - Activation Functions
- Lecture 37 - Gradient Descent
- Lecture 38 - Feedforward and Backpropagation Neural Network
- Lecture 39 - Why Word2Vec?
- Lecture 40 - What are CBOW and Skip-Gram Models?
- Lecture 41 - One word learning architecture
- Lecture 42 - Forward pass for Word2Vec
- Lecture 43 - Matrix Operations Explained
- Lecture 44 - CBOW and Skip Gram Models
- Lecture 45 - Building Skip-gram model using Python
- Lecture 46 - Reduction of complexity - sub-sampling, negative sampling
- Lecture 47 - Binay tree, Hierarchical softmax
- Lecture 48 - Mapping the output layer to Softmax
- Lecture 49 - Updating the weights using hierarchical softmax
- Lecture 50 - Discussion on the results obtained from word2vec
- Lecture 51 - Recap and Introduction
- Lecture 52 - ANN as a LM and its limitations
- Lecture 53 - Sequence Learning and its applications
- Lecture 54 - Introuduction to Recurrent Neural Network
- Lecture 55 - Unrolled RNN
- Lecture 56 - RNN - Based Language Model
- Lecture 57 - BPTT - Forward Pass
- Lecture 58 - BPTT - Derivatives for W,V and U
- Lecture 59 - BPTT - Exploding and vanishing gradient
- Lecture 60 - LSTM
- Lecture 61 - Truncated BPTT
- Lecture 62 - GRU
- Lecture 63 - Introduction and Historical Approaches to Machine Translation
- Lecture 64 - What is SMT?
- Lecture 65 - Noisy Channel Model, Bayes Rule, Language Model
- Lecture 66 - Translation Model, Alignment Variables
- Lecture 67 - Alignments again!
- Lecture 68 - IBM Model 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - IBM Model 2
- Lecture 70 - Introduction to Phrase-based translation
- Lecture 71 - Symmetrization of alignments
- Lecture 72 - Extraction of Phrases
- Lecture 73 - Learning/estimating the phrase probabilities using another Symmetrization example
- Lecture 74 - Introduction to evaluation of Machine Translation
- Lecture 75 - BLEU - A short Discussion of the seminal paper
- Lecture 76 - BLEU Demo using NLTK and other Metrics
- Lecture 77 - Encoder-Decoder model for Neural Machine Translation
- Lecture 78 - RNN Based Machine Translation
- Lecture 79 - Recap and Connecting Bloom Taxonomy with Machine Learning
- Lecture 80 - Introduction to Attention based Translation
- Lecture 81 - Research Paper discussion on Neural machine translation by jointly learning to align and translate
- Lecture 82 - Typical NMT architecture and models for multi-language translation
- Lecture 83 - Beam Search, Stochastic Gradient Descent, Mini Batch, Batch
- Lecture 84 - Beam Search, Stochastic Gradient Descent, Mini Batch, Batch
- Lecture 85 - Introduction to Conversation Modeling
- Lecture 86 - A few examples in Conversation Modeling
- Lecture 87 - Some ideas to Implement IR-based Conversation Modeling
- Lecture 88 - Discussion of some ideas in Question Answering
- Lecture 89 - Hyperspace Analogue to Language - HAL
- Lecture 90 - Correlated Occurrence Analogue to Lexical Semantic - COALS
- Lecture 91 - Global Vectors - Glove
- Lecture 92 - Evaluation of Word vectors

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Python for Data Science

Subject Co-ordinator - Prof. Rangunathan Rengasamy

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Python for Data Science  
Lecture 2 - Introduction to Python  
Lecture 3 - Introduction to Spyder - Part 1  
Lecture 4 - Introduction to Spyder - Part 2  
Lecture 5 - Variables and Datatypes  
Lecture 6 - Operators  
Lecture 7 - Jupyter setup  
Lecture 8 - Sequence data - Part 1  
Lecture 9 - Sequence data - Part 2  
Lecture 10 - Sequence data - Part 3  
Lecture 11 - Sequence data - Part 4  
Lecture 12 - Numpy  
Lecture 13 - Reading data  
Lecture 14 - Pandas Dataframes - I  
Lecture 15 - Pandas Dataframes - II  
Lecture 16 - Pandas Dataframes - III  
Lecture 17 - Control structures and Functions  
Lecture 18 - Exploratory data analysis  
Lecture 19 - Data Visualization - Part I  
Lecture 20 - Data Visualization - Part II  
Lecture 21 - Dealing with missing data  
Lecture 22 - Introduction to Classification Case Study  
Lecture 23 - Case Study on Classification - Part I  
Lecture 24 - Case Study on Classification - Part II  
Lecture 25 - Introduction to Regression Case Study  
Lecture 26 - Case Study on Regression - Part I  
Lecture 27 - Case Study on Regression - Part II  
Lecture 28 - Case Study on Regression - Part III  
Lecture 29 - Module : Predictive Modelling

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Linear Regression
- Lecture 31 - Model Assessment
- Lecture 32 - Diagnostics to Improve Linear Model Fit
- Lecture 33 - Cross Validation
- Lecture 34 - Classification
- Lecture 35 - Logistic Regression
- Lecture 36 - K-Nearest Neighbors (kNN)
- Lecture 37 - K-means Clustering
- Lecture 38 - Logistic Regression (Continued...)
- Lecture 39 - Decision Trees
- Lecture 40 - Multiple Linear Regression

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Practical Machine Learning with Tensorflow

Subject Co-ordinator - Dr. B. Ravindran

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Overview of Tensorflow  
Lecture 2 - Machine Learning Refresher  
Lecture 3 - Steps in Machine Learning Process  
Lecture 4 - Loss Functions in Machine Learning  
Lecture 5 - Gradient Descent  
Lecture 6 - Gradient Descent Variations  
Lecture 7 - Model Selection and Evaluation  
Lecture 8 - Machine Learning Visualization  
Lecture 9 - Deep Learning Refresher  
Lecture 10 - Introduction to Tensors  
Lecture 11 - Mathematical Foundations of Deep Learning (Continued...)  
Lecture 12 - Building Data Pipelines for Tensorflow - Part 1  
Lecture 13 - Building Data Pipelines for Tensorflow - Part 2  
Lecture 14 - Building Data Pipelines for Tensorflow - Part 3  
Lecture 15 - Text Processing with Tensorflow  
Lecture 16 - Classify Images  
Lecture 17 - Regression  
Lecture 18 - Classify Structured Data  
Lecture 19 - Text Classification  
Lecture 20 - Underfitting and Overfitting  
Lecture 21 - Save and Restore Models  
Lecture 22 - CNNs - Part 1  
Lecture 23 - CNNs - Part 2  
Lecture 24 - Transfer learning with pretrained CNNs  
Lecture 25 - Transfer learning with TF hub  
Lecture 26 - Image classification and visualization  
Lecture 27 - Estimator API  
Lecture 28 - Logistic Regression  
Lecture 29 - Boosted Trees

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Introduction to word embeddings
- Lecture 31 - Recurrent Neural Networks - Part 1
- Lecture 32 - Recurrent Neural Networks - Part 2
- Lecture 33 - Time Series Forecasting with RNNs
- Lecture 34 - Text Generation with RNNs
- Lecture 35 - TensorFlow Customization
- Lecture 36 - Customizing tf.keras - Part 1
- Lecture 37 - Customizing tf.keras - Part 2
- Lecture 38 - TensorFlow Distributed Training

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Database Systems

Subject Co-ordinator - Prof. P.Sreenivasa Kumar

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Database Architecture
- Lecture 3 - RDBMS Architecture
- Lecture 4 - Introduction to ER Model
- Lecture 5 - Entities and Relationships
- Lecture 6 - Modelling Weak Entities and Design Choices
- Lecture 7 - Relational Data Model and Notion of Keys
- Lecture 8 - Introduction to Relational Algebra
- Lecture 9 - Operators in Relational Model
- Lecture 10 - Uses of Renaming, Join and Division in Relation Algebra
- Lecture 11 - Example Queries in Relation Model and Outer Join Operation
- Lecture 12 - Convert ER-Model to a Relational Model
- Lecture 13 - Introduction to tuple relational calculus
- Lecture 14 - Example TRC queries
- Lecture 15 - Data definition using SQL
- Lecture 16 - Basic SQL query block and subqueries
- Lecture 17 - Correlated subqueries
- Lecture 18 - Aggregate functions
- Lecture 19 - Views
- Lecture 20 - Programmatic access of SQL
- Lecture 21 - Normal forms - Introduction
- Lecture 22 - Deriving new functional dependencies
- Lecture 23 - Proving soundness and completeness of Armstrong's Axioms
- Lecture 24 - Normal forms - 2NF, 3NF, BCNF
- Lecture 25 - Properties of decompositions
- Lecture 26 - Normal forms - 4NF, 5NF
- Lecture 27 - Introduction to file organization
- Lecture 28 - File organization methods
- Lecture 29 - Dynamic File organization using Hashing

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Index structures
- Lecture 31 - B+ trees on Disks
- Lecture 32 - Performance and Reliability of Multiple Disks
- Lecture 33 - Relational Query Evaluation
- Lecture 34 - Join operator processing algorithms
- Lecture 35 - Query optimization
- Lecture 36 - ACID properties and operations in transactions
- Lecture 37 - Schedules
- Lecture 38 - Concurrency control using Locks
- Lecture 39 - Recovery using undo logging method
- Lecture 40 - Recovery using Redo and Undo-Redo logging methods
- Lecture 41 - Recoverable schedules and transaction isolation levels

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Foundations of Cryptography

Subject Co-ordinator - Prof. Ashish Choudhury

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Symmetric-key Encryption
- Lecture 3 - Historical Ciphers and their Cryptanalysis
- Lecture 4 - Perfect Security
- Lecture 5 - Limitations of Perfect Security
- Lecture 6 - Introduction to Computational Security
- Lecture 7 - Semantic Security
- Lecture 8 - Pseudo-random Generators (PRGs)
- Lecture 9 - Operations on Pseudorandom Generators
- Lecture 10 - Stream Ciphers
- Lecture 11 - Provably-secure Instantiation of PRG
- Lecture 12 - Practical Instantiations of PRG
- Lecture 13 - CPA-security
- Lecture 14 - Pseudo-random Functions (PRFs)
- Lecture 15 - CPA-secure Encryption from PRF
- Lecture 16 - Modes of Operations of Block Ciphers - Part I
- Lecture 17 - Modes of Operations of Block Ciphers - Part II
- Lecture 18 - Theoretical Constructions of Block Ciphers
- Lecture 19 - Practical Constructions of Block Ciphers - Part I
- Lecture 20 - Practical Constructions of Block Ciphers - Part II
- Lecture 21 - From Passive to Active Adversary
- Lecture 22 - Message Integrity and Authentication
- Lecture 23 - Message Authentication for Long Messages - Part I
- Lecture 24 - Message Authentication for Long Messages - Part II
- Lecture 25 - Information-theoretic MACs - Part I
- Lecture 26 - Information-theoretic MACs - Part II
- Lecture 27 - Cryptographic Hash Functions - Part I
- Lecture 28 - Cryptographic Hash Functions - Part II
- Lecture 29 - Message Authentication Using Hash Functions

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Generic Attacks on Hash Functions and Additional Applications of Hash Functions
- Lecture 31 - Random Oracle Model - Part I
- Lecture 32 - Random Oracle Model - Part II
- Lecture 33 - Authenticated Encryption
- Lecture 34 - Composing CPA-secure Cipher with a Secure MAC - Part I
- Lecture 35 - Composing CPA-secure Cipher with a Secure MAC - Part II
- Lecture 36 - Key-Exchange Protocols - Part I
- Lecture 37 - Key-Exchange Protocols - Part II
- Lecture 38 - Cyclic groups
- Lecture 39 - Cryptographic Hardness Assumptions in the Cyclic Groups
- Lecture 40 - Candidate Cyclic Groups for Cryptographic Purposes - Part I
- Lecture 41 - Candidate Cyclic Groups for Cryptographic Purposes - Part II
- Lecture 42 - Cryptographic Applications of the Discrete Log Assumption
- Lecture 43 - Public-key Encryption
- Lecture 44 - El Gamal Public-key Encryption Scheme
- Lecture 45 - RSA Assumption
- Lecture 46 - RSA Public-key Cryptosystem
- Lecture 47 - Hybrid Public-key Cryptosystem
- Lecture 48 - CCA-Secure Public-key Ciphers
- Lecture 49 - CCA-Secure Public-key Ciphers Based on Diffie-Hellman Problems
- Lecture 50 - CCA-Secure Public-key Ciphers Based on RSA Assumption
- Lecture 51 - Digital Signatures
- Lecture 52 - RSA Signatures
- Lecture 53 - Identification Schemes
- Lecture 54 - Schnorr Signature Scheme and TLS/SSL
- Lecture 55 - Number Theory
- Lecture 56 - Secret Sharing
- Lecture 57 - Zero-Knowledge Protocols - Part I
- Lecture 58 - Zero-Knowledge Protocols - Part II
- Lecture 59 - Good Bye for Now

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Modern Application Development

Subject Co-ordinator - Prof. Madhavan Mukund, Prof. Abhijat Vichare, Prof. Aamod Sane

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Modern Application Development - Part 1  
Lecture 2 - Introduction to Modern Application Development - Part 2  
Lecture 3 - Introduction to Modern Application Development - Part 3  
Lecture 4 - Introduction to Modern Application Development - Part 4  
Lecture 5 - Introduction to Modern Application Development - Part 5  
Lecture 6 - Command Line - Part 1  
Lecture 7 - Command Line - Part 2  
Lecture 8 - Command Line - Practice Questions - Part 1  
Lecture 9 - Command Line - Practice Questions - Part 2  
Lecture 10 - Comparing CLI, GUI, and Web Interfaces  
Lecture 11 - Producing HTML+CSS output - Part 1  
Lecture 12 - Producing HTML+CSS output - Part 2  
Lecture 13 - Introduction to Input in HTML  
Lecture 14 - Session 2 - Part 1  
Lecture 15 - Session 2 - Part 2  
Lecture 16 - Session 2 - Part 3  
Lecture 17 - Session 1 - Part 1 - Introduction to HTML and CSS  
Lecture 18 - Session 1 - Part 2  
Lecture 19 - Week6 - Session 1  
Lecture 20 - Week6 - Session 2  
Lecture 21 - Introduction to JDBC  
Lecture 22 - Week 7 Session 1 - Part 1  
Lecture 23 - Week 7 Session 1 - Part 2  
Lecture 24 - Week 8 Session 1  
Lecture 25 - Week 8 Session 2  
Lecture 26 - Week 8 Session 3  
Lecture 27 - Week 9 Session 1  
Lecture 28 - Week 9 Session 3  
Lecture 29 - Week 10 Part 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 30 - Week 10 Part 2

Lecture 31 - Week 10 Part 3

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Deep Learning for Computer Vision

Subject Co-ordinator - Prof. Vineeth N Balasubramanian

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Course Introduction  
Lecture 2 - History  
Lecture 3 - Image Formation  
Lecture 4 - Image Representation  
Lecture 5 - Linear Filtering  
Lecture 6 - Image in Frequency Domain  
Lecture 7 - Image Sampling  
Lecture 8 - Edge Detection  
Lecture 9 - From Edges to Blobs and Corners  
Lecture 10 - Scale Space, Image Pyramids and Filter Banks  
Lecture 11 - Feature Detectors  
Lecture 12 - Image Segmentation  
Lecture 13 - Other Feature Spaces  
Lecture 14 - Human Visual System  
Lecture 15 - Feature Matching  
Lecture 16 - Hough Transform  
Lecture 17 - From Points to Images  
Lecture 18 - Image Descriptor Matching  
Lecture 19 - Pyramid Matching  
Lecture 20 - From Traditional Vision to Deep Learning  
Lecture 21 - Neural Networks  
Lecture 22 - Neural Networks  
Lecture 23 - Feedforward Neural Networks and Backpropagation - Part 1  
Lecture 24 - Feedforward Neural Networks and Backpropagation - Part 2  
Lecture 25 - Gradient Descent and Variants - Part 1  
Lecture 26 - Gradient Descent and Variants - Part 2  
Lecture 27 - Regularization in Neural Networks - Part 1  
Lecture 28 - Regularization in Neural Networks - Part 2  
Lecture 29 - Improving Training of Neural Networks - Part 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Improving Training of Neural Networks - Part 2
- Lecture 31 - Convolutional Neural Networks
- Lecture 32 - Convolutional Neural Networks
- Lecture 33 - Backpropagation in CNNs
- Lecture 34 - Evolution of CNN Architectures for Image Classification - Part 1
- Lecture 35 - Evolution of CNN Architectures for Image Classification - Part 2
- Lecture 36 - Recent CNN Architectures
- Lecture 37 - Finetuning in CNNs
- Lecture 38 - Explaining CNNs
- Lecture 39 - Explaining CNNs
- Lecture 40 - Explaining CNNs
- Lecture 41 - Explaining CNNs
- Lecture 42 - Explaining CNNs
- Lecture 43 - Going Beyond Explaining CNNs
- Lecture 44 - CNNs for Object Detection-I - Part 1
- Lecture 45 - CNNs for Object Detection-I - Part 2
- Lecture 46 - CNNs for Object Detection-II
- Lecture 47 - CNNs for Segmentation
- Lecture 48 - CNNs for Human Understanding
- Lecture 49 - CNNs for Human Understanding
- Lecture 50 - CNNs for Human Understanding
- Lecture 51 - CNNs for Other Image Tasks
- Lecture 52 - Recurrent Neural Networks
- Lecture 53 - Backpropagation in RNNs
- Lecture 54 - LSTMs and GRUs
- Lecture 55 - Video Understanding using CNNs and RNNs
- Lecture 56 - Attention in Vision Models
- Lecture 57 - Vision and Language
- Lecture 58 - Beyond Captioning
- Lecture 59 - Other Attention Models
- Lecture 60 - Self-Attention and Transformers
- Lecture 61 - Deep Generative Models
- Lecture 62 - Generative Adversarial Networks - Part 1
- Lecture 63 - Generative Adversarial Networks - Part 2
- Lecture 64 - Variational Autoencoders
- Lecture 65 - Combining VAEs and GANs
- Lecture 66 - Beyond VAEs and GANs
- Lecture 67 - Beyond VAEs and GANs
- Lecture 68 - GAN Improvements

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Deep Generative Models across Multiple Domains
- Lecture 70 - VAEs and Disentanglement
- Lecture 71 - Deep Generative Models
- Lecture 72 - Deep Generative Models
- Lecture 73 - Few-shot and Zero-shot Learning - Part 1
- Lecture 74 - Few-shot and Zero-shot Learning - Part 2
- Lecture 75 - Self-Supervised Learning
- Lecture 76 - Adversarial Robustness
- Lecture 77 - Pruning and Model Compression
- Lecture 78 - Neural Architecture Search
- Lecture 79 - Course Conclusion

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Artificial Intelligence Search Methods For Problems

Subject Co-ordinator - Prof. Deepak Khemani

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Prologue
- Lecture 2 - The Winograd Schema Challenge
- Lecture 3 - Introduction (2013 version)
- Lecture 4 - Can Machines Think?
- Lecture 5 - The Turing Test
- Lecture 6 - Language and Thought
- Lecture 7 - The Willing Suspension of Disbelief
- Lecture 8 - Machines with Wheels and Gears
- Lecture 9 - The Notion of Mind in Philosophy
- Lecture 10 - Reasoning = Computation
- Lecture 11 - Concepts and Categories
- Lecture 12 - How did AI get its name?
- Lecture 13 - The Chess Saga
- Lecture 14 - A Brief History of AI
- Lecture 15 - The Worlds in our Minds
- Lecture 16 - Epiphemona in Computers
- Lecture 17 - State Space Search
- Lecture 18 - Domain Independent Algorithms
- Lecture 19 - Deterministic Search
- Lecture 20 - DFS and BFS
- Lecture 21 - Comparing DFS and BFS
- Lecture 22 - Depth First Iterative Deepening
- Lecture 23 - Heuristic Search
- Lecture 24 - Heuristic Functions and the Search Landscape
- Lecture 25 - Solution Space Search
- Lecture 26 - The Traveling Salesman Problem
- Lecture 27 - Escaping Local Optima
- Lecture 28 - Stochastic Local Search
- Lecture 29 - Genetic Algorithms

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Genetic Algorithms and SAT
- Lecture 31 - Genetic Algorithms for the TSP
- Lecture 32 - Emergent Systems
- Lecture 33 - Ant Colony Optimization
- Lecture 34 - Finding Optimal Paths
- Lecture 35 - Branch and Bound
- Lecture 36 - Algorithm A\*
- Lecture 37 - A\*
- Lecture 38 - Is A\* Admissible?
- Lecture 39 - Admissibility of A\*
- Lecture 40 - Higher, Faster ...
- Lecture 41 - B&B - A\* - wA\* - Best First
- Lecture 42 - A\*
- Lecture 43 - The Monotone Condition
- Lecture 44 - DNA Sequence Alignment
- Lecture 45 - Divide and Conquer Frontier Search.
- Lecture 46 - Smart Memory Graph Search
- Lecture 47 - Variations on A\*
- Lecture 48 - Breadth First Heuristic Search
- Lecture 49 - Beam Stack Search
- Lecture 50 - Game Theory
- Lecture 51 - Popular Recreational Games
- Lecture 52 - Board Games and Game Trees
- Lecture 53 - The Evaluation Function in Board Games
- Lecture 54 - Algorithm Minimax and Alpha-Beta Pruning
- Lecture 55 - A Cluster of Strategies
- Lecture 56 - SSS\*
- Lecture 57 - SSS\*
- Lecture 58 - Automated Domain Independent Planning
- Lecture 59 - The Blocks World Domain
- Lecture 60 - State Space Planning
- Lecture 61 - Goal Stack Planning (GSP)
- Lecture 62 - GSP
- Lecture 63 - Plan Space Planning (PSP)
- Lecture 64 - PSP
- Lecture 65 - Multi-Armed Robots
- Lecture 66 - Means-Ends Analysis
- Lecture 67 - The Planning Graph
- Lecture 68 - Algorithm Graphplan

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Problem Decomposition.
- Lecture 70 - Algorithm AO\*
- Lecture 71 - AO\*
- Lecture 72 - Rule Based Expert Systems
- Lecture 73 - The Inference Engine
- Lecture 74 - The OPS5 Language
- Lecture 75 - Conflict Resolution
- Lecture 76 - Business Rule Management Systems
- Lecture 77 - The Rete Net
- Lecture 78 - Rete Algorithm
- Lecture 79 - Rete Algorithm
- Lecture 80 - Reasoning in Logic
- Lecture 81 - Rules of Inference
- Lecture 82 - Forward Reasoning
- Lecture 83 - First Order Logic
- Lecture 84 - Implicit Quantifier Notation
- Lecture 85 - Backward Reasoning
- Lecture 86 - Depth First Search on Goal Trees
- Lecture 87 - Incompleteness...
- Lecture 88 - Constraint Satisfaction Problems
- Lecture 89 - Binary Constraint Networks
- Lecture 90 - Interpreting Line Drawings
- Lecture 91 - Model Based Diagnosis
- Lecture 92 - Solving CSPs
- Lecture 93 - Arc Consistency
- Lecture 94 - Propagation = Reasoning
- Lecture 95 - Lookahead Search

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Computational Complexity

Subject Co-ordinator - Prof. Subrahmanyam Kalyanasundaram

Co-ordinating Institute - IIT - Hyderabad

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Computational Complexity
- Lecture 2 - The Class P
- Lecture 3 - The Class NP
- Lecture 4 - The Class NP - Alternate Definition
- Lecture 5 - Polynomial Time Reductions
- Lecture 6 - NP - Completeness
- Lecture 7 - Cook Levin Theorem - Part 1
- Lecture 8 - Cook Levin Theorem - Part 2
- Lecture 9 - More NP Complete Problems
- Lecture 10 - Polynomial Hierarchy - Part 1
- Lecture 11 - Polynomial Hierarchy - Part 2
- Lecture 12 - Polynomial Hierarchy - Part 3
- Lecture 13 - Time Hierarchy Theorem
- Lecture 14 - Introduction to Space Complexity
- Lecture 15 - NL-Completeness
- Lecture 16 - Savitch's Theorem
- Lecture 17 - NL = co-NL - Part 1
- Lecture 18 - NL = co-NL - Part 2
- Lecture 19 - PSPACE Completeness
- Lecture 20 - Games and PSPACE Completeness
- Lecture 21 - Space Hierarchy Theorem
- Lecture 22 - Ladner's Theorem
- Lecture 23 - Oracle Turing Machines
- Lecture 24 - Polynomial Hierarchy Using Oracles
- Lecture 25 - Baker-Gill-Solovay Theorem - Part 1
- Lecture 26 - Baker-Gill-Solovay Theorem - Part 2
- Lecture 27 - Randomized Complexity Classes - Part 1
- Lecture 28 - Randomized Complexity Classes - Part 2
- Lecture 29 - Randomized Complexity Classes - Part 3

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Randomized Complexity Classes - Part 4
- Lecture 31 - Comparison Between Randomized Complexity Classes
- Lecture 32 - BPP is in Polynomial Hierarchy
- Lecture 33 - Circuit Complexity - Part 1
- Lecture 34 - Circuit Complexity - Part 2
- Lecture 35 - Formal Definition of Circuits
- Lecture 36 - Hierarchy Theorem for Circuit Size
- Lecture 37 - Complexity Class : P/Poly
- Lecture 38 - Karp-Lipton Theorem
- Lecture 39 - Turing Machines That Take Advice
- Lecture 40 - Classes NC and AC
- Lecture 41 - Parity Not in AC0 - Part 1
- Lecture 42 - Parity Not in AC0 - Part 2
- Lecture 43 - Adleman's Theorem
- Lecture 44 - Polynomial Identity Testing and Bipartite Perfect Matching in RNC
- Lecture 45 - Search Bipartite Perfect Matching is in RNC - Part 1
- Lecture 46 - Search Bipartite Perfect Matching is in RNC - Part 2
- Lecture 47 - Promise Problems and Valiant-Vazirani Theorem
- Lecture 48 - Valiant Vazirani Theorem Continued
- Lecture 49 - #P and the Complexity of Counting
- Lecture 50 - Permanent is #P-Complete - Part 1
- Lecture 51 - Permanent is #P-Complete - Part 2
- Lecture 52 - Toda's Theorem - Part 1
- Lecture 53 - Toda's Theorem - Part 2
- Lecture 54 - Introduction to Communication Complexity - Part 1
- Lecture 55 - Introduction to Communication Complexity - Part 2
- Lecture 56 - Lower Bound Techniques
- Lecture 57 - Communication Complexity of Relations
- Lecture 58 - Monotone Depth Lower Bound for Matching
- Lecture 59 - Interactive Proofs
- Lecture 60 - #3SAT is in IP
- Lecture 61 - Public Coin Interactive Proofs and AM/MA
- Lecture 62 - Simulating Private Coins using Public Coins
- Lecture 63 - Summary and Concluding Remarks

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Parameterized Algorithms

Subject Co-ordinator - Prof. Neeldhara Misra

Co-ordinating Institute - IIT Gandhinagar, IMSC

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Invitation to FPT
- Lecture 2 - Formalizing FPT
- Lecture 3 - Kernelization: High Degree Rule
- Lecture 4 - Kernelization: d-Hitting Set
- Lecture 5 - Kernelization: Crown Reduciton
- Lecture 6 - Kernelization: Nemhauser-Trotter and Expansion Lemma
- Lecture 7 - Introduction to Branching
- Lecture 8 - Analyzing Recurrences
- Lecture 9 - High-Degree Branching for FVS
- Lecture 10 - Vertex Cover above LP
- Lecture 11 - Applications of Vertex Cover above Matching
- Lecture 12 - Iterative Compression I: Setting Up the Method
- Lecture 13 - Iterative Compression II: Vertex Cover and Tournament Feedback Vertex Set
- Lecture 14 - Iterative Compression III: Feedback Vertex Set and 3-Hitting Set
- Lecture 15 - Iterative Compression IV: Odd Cycle Transversal
- Lecture 16 - Introduction to Randomized Algorithms via a Simple Randomized FPT Algorithm for FVS
- Lecture 17 - Color Coding for Longest Path
- Lecture 18 - Chromatic Coding for Feedback Arc Set on Tournaments
- Lecture 19 - Random Separation and Subgraph Isomorphism
- Lecture 20 - Derandomization
- Lecture 21 - Divide and Conquer and Separator
- Lecture 22 - Towards Defining Treewidth
- Lecture 23 - Treewidth and Constructing Treedecomposition of Few Graph Classes
- Lecture 24 - Structural Properties of Treedecomposition and Win-Win
- Lecture 25 - Nice Tree Decomposition and Algorithm for Max Weight Independent Set
- Lecture 26 - Dynamic Programming Algorithm over graphs of Bounded Treewidth
- Lecture 27 - FPT Approximation Algorithm for Computing Tree Decomposition - Part 1
- Lecture 28 - FPT Approximation Algorithm for Computing Tree Decomposition - Part 2
- Lecture 29 - FPT Approximation Algorithm for Computing Tree Decomposition and Applications - Part 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - FPT Approximation Algorithm for Computing Tree Decomposition and Applications - Part 2
- Lecture 31 - Dynamic Programming Over Subsets for Set Cover
- Lecture 32 - Dynamic Programming Over Subsets for Steiner Tree
- Lecture 33 - ILP for Envy-Free Allocations and Lobbying
- Lecture 34 - ILP for Imbalance Parameterized by Vertex Cover
- Lecture 35 - Important Cuts: Basic
- Lecture 36 - Important Cuts: Enumeration and Bounds
- Lecture 37 - FPT Algorithm for Multiway Cut
- Lecture 38 - FPT Algorithm for Directed Feedback Edge Set
- Lecture 39 - Algebraic Techniques: Inclusion Exclusion (Coloring)
- Lecture 40 - Algebraic Techniques: Inclusion Exclusion (Hamiltonian Path)
- Lecture 41 - Algebraic Techniques: Matrix Multiplication
- Lecture 42 - Algebraic Techniques: Polynomial Method
- Lecture 43 - Matroids: Representative Sets
- Lecture 44 - Matroids: Representative Sets - Computation and Combinatorics
- Lecture 45 - Matroids: Representative Sets - Applications (Paths and Kernels)
- Lecture 46 - Matroids: Representative Sets - Applications (Directed Long Cycle)
- Lecture 47 - Reductions - An Introduction
- Lecture 48 - Reductions - Problems as Hard as Clique I (Clique on Regular Graphs)
- Lecture 49 - Reductions - Problems as Hard as Clique (PVC, MCC, MIS)
- Lecture 50 - Reductions - Problems as Hard as Clique (Dominating Set, Set Cover)

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Getting Started with Competitive Programming

Subject Co-ordinator - Prof. Neeldhara Misra

Co-ordinating Institute - IIT - Gandhinagar

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 0 - Welcome and Initial Setup  
Lecture 1 - Reversort  
Lecture 2 - Engineering Reversort  
Lecture 3 - Number Game  
Lecture 4 - Will It Stop?  
Lecture 5 - Trouble Sort  
Lecture 6 - The Meeting Place Cannot Be Changed  
Lecture 7 - Magic Ship  
Lecture 8 - Simple Skewness  
Lecture 9 - Pancake Flipping  
Lecture 10 - Islands War  
Lecture 11 - Stable Marriage - I  
Lecture 12 - Stable Marriage - II  
Lecture 13 - When Greedy Does Not Work - Coin Change  
Lecture 14 - When Greedy Does Not Work - Guarding a Museum  
Lecture 15 - When Greedy Does Not Work - Traveling Salesman  
Lecture 16 - DSU - Definition and Motivation  
Lecture 17 - DSU via Union by Rank and Path Compression  
Lecture 18 - DSU - Implementation  
Lecture 19 - Destroying Array - I (Problem Statement and Solution)  
Lecture 20 - Destroying Array - II (Implementation)  
Lecture 21 - War-I (Problem Statement)  
Lecture 22 - War-II (Solution)  
Lecture 23 - War-III (Implementation)  
Lecture 24 - Graph Foundations  
Lecture 25 - BFS and DFS  
Lecture 26 - Mahmoud and Ehab and the bipartiteness  
Lecture 27 - Cover It!  
Lecture 28 - Diamond Inheritance

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 29 - SSSP - Overview BFS Revisited
- Lecture 30 - SSSP and Dijkstra's Algorithm
- Lecture 31 - Sending Email
- Lecture 32 - SSSP and Modified Dijkstra
- Lecture 33 - SSSP with Negative Cycles - Bellman-Ford
- Lecture 34 - Wormholes
- Lecture 35 - APSP and Floyd-Warshall
- Lecture 36 - Page Hopping
- Lecture 37 - Introduction to MSTs
- Lecture 38 - Prim's Algorithm
- Lecture 39 - Kruskal's Algorithm
- Lecture 40 - Cherries Mesh
- Lecture 41 - Heirarchy
- Lecture 42 - Island Hopping
- Lecture 43 - Introduction to MaxFlow
- Lecture 44 - Ford-Fulkerson for MaxFlow
- Lecture 45 - Implementing Edmonds-Karp
- Lecture 46 - Maximum Matching via MaxFlow
- Lecture 47 - Sport Elimination via MaxFlow
- Lecture 48 - Maxflow-Mincut Duality
- Lecture 49 - Police Chase
- Lecture 50 - Sam I AM and Vertex Covers
- Lecture 51 - Top-Down Dynamic Programming with Frog 1 - Part A
- Lecture 52 - Top-Down Dynamic Programming with Frog 1 - Part B
- Lecture 53 - Bottom-Up Dynamic Programming with Dice Combinations

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Quantum Computing: Quantum Algorithms

Subject Co-ordinator - Prof. Prabha Mandayam

Co-ordinating Institute - IBM and IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Quantum Computing Roadmap
- Lecture 2 - Quantum Mission in India
- Lecture 3 - A Brief Introduction to Applications of Quantum
- Lecture 4 - Quantum Computing Basics
- Lecture 5 - Postulates of Quantum Mechanics - Part 1
- Lecture 6 - Postulates of Quantum Mechanics - Part 2
- Lecture 7 - Quantum Measurements
- Lecture 8 - Quantum Gates and Circuits - Part 1
- Lecture 9 - Quantum Gates and Circuits - Part 2
- Lecture 10 - Programming using IBM Quantum Experience and Circuit Composer
- Lecture 11 - Quantum Computing Concepts: Entanglement and Interference - Part 1
- Lecture 12 - Quantum Computing Concepts: Entanglement and Interference - Part 2
- Lecture 13 - Programming using Qiskit - Part 1
- Lecture 14 - Programming using Qiskit - Part 2
- Lecture 15 - Quantum Algorithms: Deutsch Jozsa Algorithm
- Lecture 16 - Quantum Algorithms: Bernstein Vazirani Algorithm
- Lecture 17 - Quantum Algorithms: Grover's Search
- Lecture 18 - Grover's algorithm Programming
- Lecture 19 - NISQ-era quantum algorithms
- Lecture 20 - Variational Quantum Algorithms
- Lecture 21 - Variational Quantum Eigensolver
- Lecture 22 - Quantum Generative Adversarial Networks (QGANs)
- Lecture 23 - Fixing quantum errors with quantum tricks: A brief introduction to QEC - Part 1
- Lecture 24 - Fixing quantum errors with quantum tricks: A brief introduction to QEC - Part 2
- Lecture 25 - Fixing quantum errors with quantum tricks: A brief introduction to QEC - Part 3

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Systems and Usable Security

Subject Co-ordinator - Prof. Neminath Hubballi

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Computer Security - Part 1
- Lecture 2 - Introduction to Computer Security - Part 2
- Lecture 3 - Malicious Software - Part 1
- Lecture 4 - Malicious Software - Part 2
- Lecture 5 - Social Engineering and Phishing Attacks - Part 1
- Lecture 6 - Social Engineering and Phishing Attacks - Part 2
- Lecture 7 - Operating System Security - Part 1
- Lecture 8 - Operating System Security - Part 2
- Lecture 9 - Operating System Security - Part 3
- Lecture 10 - Operating System Security - Part 4
- Lecture 11 - Email Security - Part 1
- Lecture 12 - Email Security - Part 2
- Lecture 13 - Transport Layer Security - Part 1
- Lecture 14 - Transport Layer Security - Part 2
- Lecture 15 - IP Security - Part 1
- Lecture 16 - IP Security - Part 2
- Lecture 17 - Security and Usability Overview
- Lecture 18 - User Privacy and Usability

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Online Privacy

Subject Co-ordinator - Prof. Ponnurangam Kumaraguru

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Online Privacy
- Lecture 2 - Privacy concepts and studies
- Lecture 3 - Fair Information Practices
- Lecture 4 - Right to Privacy Contextual Integrity
- Lecture 5 - Privacy Policy - Part I
- Lecture 6 - Privacy Policy - Part II
- Lecture 7 - Privacy-based technologies and decision making
- Lecture 8 - Social Media Privacy
- Lecture 9 - Identity resolution
- Lecture 10 - Privacy Nudges
- Lecture 11 - Cookies
- Lecture 12 - Ethics about studying Online Privacy
- Lecture 13 - Anonymization techniques and Differential Privacy
- Lecture 14 - Conducting (user, lab, online) studies
- Lecture 15 - Research paper reading
- Lecture 16 - Voter and Browser Privacy Leaks, Profiling form PII - Part I
- Lecture 17 - Voter and Browser Privacy Leaks, Profiling form PII - Part II
- Lecture 18 - Online Privacy Tools (Hands-on) - Part I
- Lecture 19 - Online Privacy Tools (Hands-on) - Part II
- Lecture 20 - Mobile numbers, home location, Location-based social networks
- Lecture 21 - Location-based social networks
- Lecture 22 - Privacy laws and regulations - Part I
- Lecture 23 - Privacy laws and regulations - Part II
- Lecture 24 - Privacy standards
- Lecture 25 - Look back

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Machine Learning (Tamil)

Subject Co-ordinator - Prof. Arun Rajkumar

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Paradigms of Machine Learning  
Lecture 2 - Few more examples  
Lecture 3 - Types of Learning  
Lecture 4 - Types of supervised learning  
Lecture 5 - Mathematical tools  
Lecture 6 - Three Fundamental spaces  
Lecture 7 - Conditional Probability  
Lecture 8 - Bayes Theorem  
Lecture 9 - Continuous Probability  
Lecture 10 - Introduction to vectors  
Lecture 11 - Span of vectors  
Lecture 12 - Linear Independence  
Lecture 13 - Basis of vector space  
Lecture 14 - Orthogonality and Projection  
Lecture 15 - Introduction to Regression  
Lecture 16 - Linear regression  
Lecture 17 - Geometrical Interpretation  
Lecture 18 - Visual Guide to Orthogonal Projection  
Lecture 19 - Iterative solution: Gradient descent  
Lecture 20 - Gradient Descent  
Lecture 21 - Choosing Step size  
Lecture 22 - Taylor Series  
Lecture 23 - Stochastic Gradient Descent and basis functions  
Lecture 24 - Regularization Techniques  
Lecture 25 - Binary Classification  
Lecture 26 - K-Nearest Neighbour Classification  
Lecture 27 - Distance metric and Cross-Validation  
Lecture 28 - Computational efficiency of KNN  
Lecture 29 - Introduction to Decision Trees

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Level splitting
- Lecture 31 - Measure of Impurity
- Lecture 32 - Entropy and Information Gain
- Lecture 33 - Generative vs Discriminative models
- Lecture 34 - Naive Bayes classifier
- Lecture 35 - Conditional Independence
- Lecture 36 - Classifying the test point and summary
- Lecture 37 - Discriminative models
- Lecture 38 - Logistic Regression
- Lecture 39 - Summary and big picture
- Lecture 40 - Maximum likelihood estimation
- Lecture 41 - Linear separability
- Lecture 42 - Perceptron and its learning algorithm
- Lecture 43 - Perceptron : A thing of past
- Lecture 44 - Support Vector Machine
- Lecture 45 - Optimizing weights
- Lecture 46 - Handling Outliers
- Lecture 47 - Dual Formulation
- Lecture 48 - Kernel formulation
- Lecture 49 - Introduction to Ensemble methods
- Lecture 50 - Bagging
- Lecture 51 - Bootstrapping
- Lecture 52 - Limitations of bagging
- Lecture 53 - Introduction to boosting
- Lecture 54 - Ada boost
- Lecture 55 - Unsupervised learning
- Lecture 56 - K-means Clustering
- Lecture 57 - Lloyd's Algorithms
- Lecture 58 - Convergence and Initialization
- Lecture 59 - Representation Learning
- Lecture 60 - Orthogonal Projection
- Lecture 61 - Covariance Matrix and Eigen direction
- Lecture 62 - PCA and mean centering



# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Compiler Design (Prof. Rupesh Nasre)

Subject Co-ordinator - Prof. Rupesh Nasre

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction - Part 1, Programming languages and compilers  
Lecture 2 - Introduction - Part 2, Language translators  
Lecture 3 - Introduction - Part 3, Phases of a compiler  
Lecture 4 - Introduction - Part 4, Static vs Dynamic contexts, Parameter passing  
Lecture 5 - Lexing - Part 1, Terminology, Regex, flex tool- Part 1  
Lecture 6 - Lexing - Part 2, Lexical errors, Input buffering  
Lecture 7 - flex tool- Part 2  
Lecture 8 - Lexing - Part 3, Lookahead, KMP string matching  
Lecture 9 - Lexing - Part 4, Regex to DFA conversion - Part 1  
Lecture 10 - Lexing - Part 5, Regex to DFA conversion - Part 2, Prasing - Part 1  
Lecture 11 - Parsing - Part 2, CFG, Parse tree, Precedence, Ambiguity  
Lecture 12 - flex tool - Part 3  
Lecture 13 - Parsing - Part 3, Sentinel forms, Error recovery, if-else ambiguity  
Lecture 14 - Parsing - Part 4, Left recursion, Recursive descent parsing  
Lecture 15 - Parsing - Part 5, First and Follow, Predictive parsing table  
Lecture 16 - Parsing - Part 6, Predictive parsing table, LL(1) grammars  
Lecture 17 - Discussions and doubts clarification - Part 1  
Lecture 18 - Parsing - Part 6, Bottom-up, Shift-reduce parsing, SLR parsing  
Lecture 19 - Parsing - Part 6, LR(0) automaton, SLR parsing using automaton  
Lecture 20 - Parsing - Part 7, SLR(1) parsing table, SLR(1) parsing algorithm  
Lecture 21 - Parsing - Part 8, Viable prefixes, LR(1) parsing, LR(1) automaton  
Lecture 22 - Parsing - Part 9, LALR parsing, SDT- Part 1, attributes  
Lecture 23 - Syntax Directed Translation - Part 2, S- and L-attributed SDD  
Lecture 24 - Syntax Directed Translation - Part 3, L-attributed SDD, Applications  
Lecture 25 - Syntax Directed Translation - Part 4, Actions within productions  
Lecture 26 - Discussions and doubts clarification - Part 2  
Lecture 27 - Quiz-1 discussion, SDT - Part 5, Code generation for while loop  
Lecture 28 - Intermediate Code Generation - Part 1, Syntax trees and DAGs  
Lecture 29 - Intermediate Code Generation - Part 2, Three-address code

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Discussions and doubts clarification Part 3
- Lecture 31 - Intermediate Code Generation - Part 3, Static single assignment
- Lecture 32 - Intermediate Code Generation - Part 4, IR for type expressions
- Lecture 33 - Intermediate Code Generation - Part 4, IR for array expressions
- Lecture 34 - Intermediate Code Generation - Part 4, IR for boolean expressions
- Lecture 35 - Intermediate Code Generation - Part 4, IR for break, continue, switch
- Lecture 36 - Code Generator - Part 1, Introduction, IR and target code
- Lecture 37 - Code Generator - Part 2, Instruction selection, ordering
- Lecture 38 - Code Generator - Part 2, Basic blocks and CFG
- Lecture 39 - x86 assembly code
- Lecture 40 - Code optimizer - Part 1, Local optimizations within a basic block
- Lecture 41 - Code optimizer - Part 2, Array references, Peephole optimization
- Lecture 42 - Discussions and doubts clarification - Part 4
- Lecture 43 - Code optimizer - Part 3, Register allocation, Liveness
- Lecture 44 - Code optimizer - Part 4, Register allocation as graph coloring
- Lecture 45 - Discussions and doubts clarification - Part 5
- Lecture 46 - Code optimizer - Part 5, Data flow analysis, Reaching definitions
- Lecture 47 - Discussions and doubts clarification - Part 6
- Lecture 48 - Code optimizer - Part 6, DFA for reaching definitions, Live variables

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Applied Accelerated Artificial Intelligence

Subject Co-ordinator - Prof. Satyadhyan Chickerur, Prof. Bharatkumar Sharma, Prof. Adesuyi Tosin, Prof. Satya

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to AI Systems Hardware - Part 1
- Lecture 2 - Introduction to AI Systems Hardware - Part 2
- Lecture 3 - Introduction to AI Accelerators, GPUs
- Lecture 4 - Introduction to Operating Systems, Virtualization, Cloud - Part 1
- Lecture 5 - Introduction to Operating Systems, Virtualization, Cloud - Part 2
- Lecture 6 - Introduction to Containers and IDE Dockers - Part 1
- Lecture 7 - Introduction to Containers and IDE Dockers - Part 2
- Lecture 8 - Scheduling and Resource Management - Part 1
- Lecture 9 - Scheduling and Resource Management - Part 2
- Lecture 10 - DeepOps: Deep Dive into Kubernetes with deployment of various AI based Services - Part 1
- Lecture 11 - DeepOps: Deep Dive into Kubernetes with deployment of various AI based Services - Part 2
- Lecture 12 - DeepOps: Deep Dive into Kubernetes with deployment of various AI based Services Session II - Part 1
- Lecture 13 - DeepOps: Deep Dive into Kubernetes with deployment of various AI based Services Session II - Part 2
- Lecture 14 - Design principles for Building High Performance Clusters - Part 1
- Lecture 15 - Design principles for Building High Performance Clusters - Part 2
- Lecture 16 - Design principles for Building High Performance Clusters - Part 3
- Lecture 17 - Design principles for Building High Performance Clusters - Part 4
- Lecture 18 - Introduction to Pytorch - Part 1
- Lecture 19 - Introduction to Pytorch - Part 2
- Lecture 20 - Introduction to Pytorch - Part 3
- Lecture 21 - Introduction to Pytorch - Part 4
- Lecture 22 - Profiling with DLProf Pytorch Catalyst - Part 1
- Lecture 23 - Profiling with DLProf Pytorch Catalyst - Part 2
- Lecture 24 - Introduction to TensorFlow - Part 1
- Lecture 25 - Introduction to TensorFlow - Part 2
- Lecture 26 - Accelerated TensorFlow - Part 1
- Lecture 27 - Accelerated TensorFlow - Part 2
- Lecture 28 - Accelerated TensorFlow - XLA Approach - Part 1
- Lecture 29 - Accelerated TensorFlow - XLA Approach - Part 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Optimizing Deep learning Training: Automatic Mixed Precision - Part 1
- Lecture 31 - Optimizing Deep learning Training: Automatic Mixed Precision - Part 2
- Lecture 32 - Optimizing Deep learning Training: Transfer Learning - Part 1
- Lecture 33 - Optimizing Deep learning Training: Transfer Learning - Part 2
- Lecture 34 - Fundamentals of Distributed AI Computing Session 1 - Part 1
- Lecture 35 - Fundamentals of Distributed AI Computing Session 1 - Part 2
- Lecture 36 - Fundamentals of Distributed AI Computing Session 2 - Part 1
- Lecture 37 - Fundamentals of Distributed AI Computing Session 2 - Part 2
- Lecture 38 - Distributed Deep Learning using Tensorflow and Horovod
- Lecture 39 - Challenges with Distributed Deep Learning Training Convergence
- Lecture 40 - Fundamentals of Accelerating Deployment - Part 1
- Lecture 41 - Fundamentals of Accelerating Deployment - Part 2
- Lecture 42 - Accelerating neural network inference in PyTorch and TensorFlow - Part 1
- Lecture 43 - Accelerating neural network inference in PyTorch and TensorFlow - Part 2
- Lecture 44 - Accelerated Data Analytics - Part 1
- Lecture 45 - Accelerated Data Analytics - Part 2
- Lecture 46 - Accelerated Data Analytics - Part 3
- Lecture 47 - Accelerated Data Analytics - Part 4
- Lecture 48 - Accelerated Machine Learning
- Lecture 49 - Scale Out with DASK
- Lecture 50 - Web visualizations to GPU accelerated crossfiltering - Part 1
- Lecture 51 - Web visualizations to GPU accelerated crossfiltering - Part 2
- Lecture 52 - Accelerated ETL Pipeline with SPARK - Part 1
- Lecture 53 - Accelerated ETL Pipeline with SPARK - Part 2
- Lecture 54 - Applied AI: Smart City (Intelligent Video Analytics) Session 1 - Part 1
- Lecture 55 - Applied AI: Smart City (Intelligent Video Analytics) Session 1 - Part 2
- Lecture 56 - Applied AI: Smart City (Intelligent Video Analytics) Session 2 Deepstream - Part 1
- Lecture 57 - Applied AI: Smart City (Intelligent Video Analytics) Session 2 Deepstream - Part 2
- Lecture 58 - Applied AI: Health care Session I - Part 1
- Lecture 59 - Applied AI: Health care Session I - Part 2
- Lecture 60 - Applied AI: Health care Session II - Part 1
- Lecture 61 - Applied AI: Health care Session II - Part 2

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Social Network Analysis

Subject Co-ordinator - Prof. Tanmoy Chakraborty

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Chapter 1 Lectuer 1  
Lecture 2 - Chapter 1 Lectuer 2  
Lecture 3 - Chapter 1 Lectuer 3  
Lecture 4 - Tutorial 1: Introduction to Python/Colab  
Lecture 5 - Tutorial 2: Introduction to NetworkX - Part I  
Lecture 6 - Chapter 2 Lectuer 1  
Lecture 7 - Chapter 2 Lectuer 2  
Lecture 8 - Chapter 2 Lectuer 3  
Lecture 9 - Chapter 2 Lectuer 4  
Lecture 10 - Chapter 2 Lectuer 5  
Lecture 11 - Chapter 2 Lectuer 6  
Lecture 12 - Tutorial 3: Introduction to NetworkX - Part II  
Lecture 13 - Chapter 3 Lectuer 1  
Lecture 14 - Chapter 3 Lectuer 2  
Lecture 15 - Chapter 3 Lectuer 3  
Lecture 16 - Chapter 3 Lectuer 4  
Lecture 17 - Chapter 3 Lectuer 5  
Lecture 18 - Chapter 3 Lectuer 6  
Lecture 19 - Chapter 3 Lectuer 7  
Lecture 20 - Chapter 4 Lectuer 1  
Lecture 21 - Chapter 4 Lectuer 2  
Lecture 22 - Chapter 4 Lectuer 3  
Lecture 23 - Chapter 4 Lectuer 4  
Lecture 24 - Chapter 4 Lectuer 5  
Lecture 25 - Chapter 4 Lectuer 6  
Lecture 26 - Tutorial 4  
Lecture 27 - Chapter 5 Lectuer 1  
Lecture 28 - Chapter 5 Lectuer 2  
Lecture 29 - Chapter 5 Lectuer 3

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 30 - Chapter 5 Lectuer 4  
Lecture 31 - Chapter 5 Lectuer 5  
Lecture 32 - Chapter 5 Lectuer 6  
Lecture 33 - Chapter 5 Lectuer 7  
Lecture 34 - Chapter 5 Lectuer 8  
Lecture 35 - Chapter 5 Lectuer 9  
Lecture 36 - Chapter 5 Lectuer 10  
Lecture 37 - Chapter 6 Lectuer 1  
Lecture 38 - Chapter 6 Lectuer 2  
Lecture 39 - Chapter 6 Lectuer 3  
Lecture 40 - Chapter 6 Lectuer 4  
Lecture 41 - Chapter 6 Lectuer 5  
Lecture 42 - Chapter 7 Lectuer 1  
Lecture 43 - Chapter 7 Lectuer 2  
Lecture 44 - Chapter 7 Lectuer 3  
Lecture 45 - Chapter 7 Lectuer 4  
Lecture 46 - Chapter 7 Lectuer 5  
Lecture 47 - Chapter 7 Lectuer 6  
Lecture 48 - Chapter 7 Lectuer 7  
Lecture 49 - Chapter 7 Lectuer 8  
Lecture 50 - chapter 8 Lectuer 1  
Lecture 51 - chapter 8 Lectuer 2  
Lecture 52 - Chapter 8 Lectuer 3  
Lecture 53 - Chapter 8 Lectuer 4  
Lecture 54 - Chapter 8 Lectuer 5  
Lecture 55 - Chapter 8 Lectuer 6  
Lecture 56 - Chapter 9 Lectuer 1  
Lecture 57 - Chapter 9 Lectuer 2  
Lecture 58 - Chapter 9 Lectuer 3  
Lecture 59 - Chapter 9 Lectuer 4  
Lecture 60 - Chapter 9 Lectuer 5  
Lecture 61 - Chapter 9 Lectuer 6  
Lecture 62 - Chapter 9 Lectuer 7  
Lecture 63 - Chapter 9 Lectuer 8  
Lecture 64 - Chapter 9 Lectuer 9  
Lecture 65 - Chapter 9 Lectuer 10  
Lecture 66 - Chapter 9 Lectuer 11  
Lecture 67 - Tutorial 5  
Lecture 68 - Chapter 10 Lectuer 1

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Lecture 69 - Chapter 10 Lectuer 2  
Lecture 70 - Chapter 10 Lectuer 3  
Lecture 71 - Chapter 10 Lectuer 4  
Lecture 72 - Chapter 10 Lectuer 5  
Lecture 73 - Conclusion - Panel discussion  
Lecture 74 - Conclusion

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Quantum Algorithms and Cryptography

Subject Co-ordinator - Prof. Shweta Agrawal

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Quantum Algorithms and Cryptography  
Lecture 2 - Basics of Quantum Information - Part 1  
Lecture 3 - Basics of Quantum Information - Part 2  
Lecture 4 - Computation and No-Cloning - Part 1  
Lecture 5 - Computation and No-Cloning - Part 2  
Lecture 6 - Computation and No-Cloning - Part 3  
Lecture 7 - Going beyond classical - Part 1  
Lecture 8 - Going beyond classical - Part 2  
Lecture 9 - Going beyond classical - Part 3  
Lecture 10 - Going beyond classical- Deutsch and Deutsch-Jozsa - Part 1  
Lecture 11 - Going beyond classical- Deutsch and Deutsch-Jozsa - Part 2  
Lecture 12 - Simon's and Bernstein's Vazirani Algorithm - Part 1  
Lecture 13 - Simon's and Bernstein's Vazirani Algorithm - Part 2  
Lecture 14 - Introduction to Cryptography - Part 1  
Lecture 15 - Introduction to Cryptography - Part 2  
Lecture 16 - Introduction to Cryptography - Part 3  
Lecture 17 - Building Cryptography - Part 1  
Lecture 18 - Building Cryptography - Part 2  
Lecture 19 - Building Cryptography - Part 3  
Lecture 20 - Building Cryptography - Part 4  
Lecture 21 - Building Cryptography - Part 5  
Lecture 22 - Building Public Key Encryption - Part 1  
Lecture 23 - Building Public Key Encryption - Part 2  
Lecture 24 - RSA Encryption - Part 1  
Lecture 25 - RSA Encryption - Part 2  
Lecture 26 - Finishing RSA, Fourier Transform - Part 1  
Lecture 27 - Finishing RSA, Fourier Transform - Part 2  
Lecture 28 - Finishing RSA, Fourier Transform - Part 3  
Lecture 29 - Grover's Algorithm - Part 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Grover's Algorithm - Part 2
- Lecture 31 - Grover's Algorithm - Part 3
- Lecture 32 - Simon's Algorithm over  $Z_n$  - Part 1
- Lecture 33 - Simon's Algorithm over  $Z_n$  - Part 2
- Lecture 34 - Simon's Algorithm over  $Z_n$  - Part 3
- Lecture 35 - Simon's Algorithm over  $Z_n$  - Part 4
- Lecture 36 - Simon's Algorithm over  $Z_n$  - Part 5
- Lecture 37 - Simon's Algorithm over  $Z_n$  - Part 6
- Lecture 38 - Shor's Algorithm - Part 1
- Lecture 39 - Shor's Algorithm - Part 2
- Lecture 40 - Hidden Subgroup Problem - Part 1
- Lecture 41 - Hidden Subgroup Problem - Part 2
- Lecture 42 - Introduction to Lattices - Part 1
- Lecture 43 - Introduction to Lattices - Part 2
- Lecture 44 - Public Key Encryption from LWE - Part 1
- Lecture 45 - Public Key Encryption from LWE - Part 2
- Lecture 46 - Public Key Encryption from LWE - Part 3
- Lecture 47 - Fully Homomorphic Encryption - Part 1
- Lecture 48 - Fully Homomorphic Encryption - Part 2
- Lecture 49 - Fully Homomorphic Encryption - Part 3
- Lecture 50 - Quantum Cryptography - Part 1
- Lecture 51 - Quantum Cryptography - Part 2
- Lecture 52 - Quantum Cryptography - Part 3
- Lecture 53 - Quantum Cryptography - Part 4
- Lecture 54 - Quantum Cryptography - Part 5
- Lecture 55 - Quantum PKE and FHE - Part 1
- Lecture 56 - Quantum PKE and FHE - Part 2
- Lecture 57 - Quantum PKE and FHE - Part 3
- Lecture 58 - Quantum PKE and FHE - Part 4
- Lecture 59 - Quantum PKE and FHE - Part 5

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Theory of Computation (2023)

Subject Co-ordinator - Prof. Subrahmanyam Kalyanasundaram

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - An Introduction to The Theory of Computation
- Lecture 2 - Notations and Terminology in Theory of Computation
- Lecture 3 - An Introduction to Finite Automata and Regular Languages - Part 1
- Lecture 4 - An Introduction to Finite Automata and Regular Languages - Part 2
- Lecture 5 - Significance of Regular Languages and Regular Operations
- Lecture 6 - Closure Properties of Regular Languages Under Union, Concatenation and Kleene Star Operation - Part 1
- Lecture 7 - Closure Properties of Regular Languages Under Union, Concatenation and Kleene Star Operation - Part 2
- Lecture 8 - An Introduction to Non-Deterministic Finite Automata (NFA)
- Lecture 9 - Formal Definitions and Examples of Non-Deterministic Finite Automata (NFA)
- Lecture 10 - Equivalence of NFA and DFA
- Lecture 11 - Closure of Regular Languages Under Regular Operations (Using NFA)
- Lecture 12 - Regular Expressions - Part 1
- Lecture 13 - Regular Expressions - Part 2
- Lecture 14 - Proving Equivalence of Regular Expression and DFA Through a GNFA
- Lecture 15 - Pumping Lemma for Regular Languages - Part 1
- Lecture 16 - Pumping Lemma for Regular Languages - Part 2
- Lecture 17 - Distinguishability of Strings and Myhill-Nerode Theorem
- Lecture 18 - Proving the Myhill-Nerode Theorem
- Lecture 19 - An Introduction to Context-Free Languages - Part 1
- Lecture 20 - An Introduction to Context-Free Languages - Part 2
- Lecture 21 - Chomsky Normal Form
- Lecture 22 - CYK Algorithm - Part 1
- Lecture 23 - CYK Algorithm - Part 2 (Example)
- Lecture 24 - Closure Properties of Context Free Languages
- Lecture 25 - An Introduction to Push Down Automata
- Lecture 26 - Normalizations in PDA and Intersection of Regular Language and CFL
- Lecture 27 - Equivalence of Context Free Grammars and Push Down Automata - Part 1
- Lecture 28 - Equivalence of Context Free Grammars and Push Down Automata - Part 2
- Lecture 29 - Equivalence of Context Free Grammars and Push Down Automata - Part 3

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Pumping Lemma for Context Free Languages
- Lecture 31 - Examples of Pumping Lemma Usage for Context Free Languages
- Lecture 32 - Formal Definition of a Turing Machine
- Lecture 33 - Turing Recognizable and Decidable Languages and TM Examples
- Lecture 34 - Multitape Turing Machine
- Lecture 35 - Non-Deterministic Turing Machines
- Lecture 36 - Equivalence of Deterministic and Nondeterministic TM
- Lecture 37 - Church-Turing Thesis
- Lecture 38 - Decidable Problems Concerning Regular Languages
- Lecture 39 - Decidable Problems Concerning Context Free Languages
- Lecture 40 - Countability of Sets
- Lecture 41 - Proof of Existence of Undecidable Languages
- Lecture 42 - Halting Problem
- Lecture 43 - Co-Turing Recognizability
- Lecture 44 - An Introduction to Mapping Reducibility
- Lecture 45 - Examples of Proving Undecidability Using Reductions
- Lecture 46 - Rice Theorem
- Lecture 47 - Computation Histories
- Lecture 48 - The Post Correspondence Problem
- Lecture 49 - Checking Ambiguity in CFG is Undecidable
- Lecture 50 - Time Complexity - Part 1
- Lecture 51 - Time Complexity - Part 2
- Lecture 52 - Non-Deterministic Polynomial Time - Part 1
- Lecture 53 - Non-Deterministic Polynomial Time - Part 2
- Lecture 54 - Verifiability and NP
- Lecture 55 - Polynomial Time Reductions - Part 1
- Lecture 56 - Polynomial Time Reductions - Part 2
- Lecture 57 - NP-Completeness
- Lecture 58 - Cook-Levin Theorem
- Lecture 59 - Cook-Levin Theorem - Proof and Implications
- Lecture 60 - CLIQUE and VERTEX-COVER is NP-Complete
- Lecture 61 - HAM-PATH is NP-Complete
- Lecture 62 - SUBSET-SUM is NP-Complete
- Lecture 63 - Knapsack Problem
- Lecture 64 - Integer Linear Program is NP-Complete
- Lecture 65 - Space Complexity and its Complexity Classes
- Lecture 66 - Logspace Reductions and NL-Completeness
- Lecture 67 - Savitch's theorem
- Lecture 68 - Results in Space Complexity

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture 69 - Summary and Concluding Remarks

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Advanced Computer Networks

Subject Co-ordinator - Prof. Neminath Hubballi, Prof. Sameer Kulkarni

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - An Introduction to High Performance Switching and Routing - Part 1  
Lecture 2 - An Introduction to High Performance Switching and Routing - Part 2  
Lecture 3 - IP Table Lookup - Part 1  
Lecture 4 - IP Table Lookup - Part 2  
Lecture 5 - IP Table Lookup: Trie Based Data Structures - Part 1  
Lecture 6 - IP Table Lookup: Trie Based Data Structures - Part 2  
Lecture 7 - IP Table Lookup: Optimized Trie based Data Structures - Part 1  
Lecture 8 - IP Table Lookup: Optimized Trie based Data Structures - Part 2  
Lecture 9 - Packet Classification - Part 1  
Lecture 10 - Packet Classification - Part 2  
Lecture 11 - Packet Classification - Part 3  
Lecture 12 - Packet Classification Implementation - Part 1  
Lecture 13 - Packet Classification Implementation - Part 2  
Lecture 14 - Traffic Management - Part 1  
Lecture 15 - Traffic Management - Part 2  
Lecture 16 - Traffic Management - Part 3  
Lecture 17 - Traffic Management - Part 4  
Lecture 18 - Traffic Management - Part 5  
Lecture 19 - Traffic Management - Part 6  
Lecture 20 - Traffic Management - Part 7  
Lecture 21 - Packet Switching Fabric Design - Part 1  
Lecture 22 - Packet Switching Fabric Design - Part 2  
Lecture 23 - Introduction to Network Softwarization  
Lecture 24 - Internet Impasse and Network Ossification  
Lecture 25 - Network Ossification  
Lecture 26 - Network Virtualization - Part 1  
Lecture 27 - Network Virtualization - Part 2  
Lecture 28 - Road to SDN  
Lecture 29 - Active Networks

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Data and Control Plane Separation
- Lecture 31 - Control Plane Abstractions
- Lecture 32 - Software Defined Networking - I
- Lecture 33 - Software Defined Networking - II
- Lecture 34 - Software Defined Networking - III
- Lecture 35 - OpenFlow
- Lecture 36 - SND Prospects and Challenges
- Lecture 37 - Introduction to Network Function Virtualization - I
- Lecture 38 - Introduction to Network Function Virtualization - II
- Lecture 39 - Network Function Virtualization - Concepts, Framework and Architecture - I
- Lecture 40 - Network Function Virtualization - Concepts, Framework and Architecture - II
- Lecture 41 - Network Function Virtualization - Road ahead and Key challenges
- Lecture 42 - High Performance Network Packet Processing
- Lecture 43 - Summary and Comparison of NFV and SDN
- Lecture 44 - Programmable Networks - Data Plane Programmability - Overview I
- Lecture 45 - Programmable Networks - Data Plane Programmability - Overview II
- Lecture 46 - Reconfigurable Match Action Tables
- Lecture 47 - P4 Programming
- Lecture 48 - Data Center Networking - Introduction - Part 1
- Lecture 49 - Data Center Networking - Introduction - Part 2
- Lecture 50 - Data Center Networking - Characteristics and Challenges
- Lecture 51 - Data Center Networking - Topologies and Architecture - Part 1
- Lecture 52 - Data Center Networking - Topologies and Architecture - Part 2
- Lecture 53 - Data Center Networking - Protocol Innovations - Part 1
- Lecture 54 - Data Center Networking - Protocol Innovations - Part 2
- Lecture 55 - Network Telemetry
- Lecture 56 - Serverless Computing - Part 1
- Lecture 57 - Serverless Computing - Part 2
- Lecture 58 - SmartNICs and In-band Network Telemetry, Future of Network Softwarization, SDN 3.0
- Lecture 59 - QUIC
- Lecture 60 - Green and Sustainable Data Centers
- Lecture 61 - Content Distribution in IP Networks - Part 1
- Lecture 62 - Content Distribution in IP Networks - Part 2
- Lecture 63 - Information Centric Networking - Part 1
- Lecture 64 - Information Centric Networking - Part 2
- Lecture 65 - Information Centric Networking - Part 3
- Lecture 66 - Named Data Networking - Part 1
- Lecture 67 - Named Data Networking - Part 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Affective Computing

Subject Co-ordinator - Prof. Jainendra Shukla, Prof. Abhinav Dhal

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Fundamentals of Affective computing  
Lecture 2 - Fundamentals of Affective computing Applications  
Lecture 3 - Emotion Psychology  
Lecture 4 - Emotion Theory  
Lecture 5 - Brain and Asymmetry  
Lecture 6 - Emotional Design  
Lecture 7 - Affect Elicitation  
Lecture 8 - Experimental Methodology  
Lecture 9 - Tutorial  
Lecture 10 - Introduction to Facial Expression Recognition  
Lecture 11 - Facial Feature Extraction  
Lecture 12 - Group Level Emotion  
Lecture 13 - Applications of Facial Expression Recognition  
Lecture 14 - Tutorial  
Lecture 15 - Tutorial  
Lecture 16  
Lecture 17  
Lecture 18  
Lecture 19  
Lecture 20 - Tutorial  
Lecture 21 - Emotions in Physiological Signals  
Lecture 22 - Tutorial  
Lecture 23 - Emotions via Skin Conductance  
Lecture 24 - Emotions Via EEG  
Lecture 25 - Multimodal Affect Recognition  
Lecture 26 - Multimodal Analysis  
Lecture 27 - MM Tutorial  
Lecture 28 - Tutorial  
Lecture 29

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30
- Lecture 31
- Lecture 32 - Emotionally Intelligent Machines - Part 1
- Lecture 33 - Emotionally Intelligent Machines - Part 2
- Lecture 34 - Case Study
- Lecture 35
- Lecture 36
- Lecture 37 - Ethics in Affective Computing - 1
- Lecture 38 - Ethics in Affective Computing - 2
- Lecture 39 - Course Finale



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Optimisation for Machine Learning: Theory and Imp

Subject Co-ordinator - Prof. Pravesh Biyani

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Basics of Linear Algebra: Linear Independence

Lecture 2 - Linear Algebra: Rank of a matrix

Lecture 3 - Linear Algebra - Subspaces of a matrix - 1

Lecture 4 - Linear Algebra - Subspaces of a matrix - 2

Lecture 5 - Linear Algebra - Null space

Lecture 6 - Linear Algebra - Eigen Vectors/Values of a matrix - 1

Lecture 7 - Linear Algebra - Eigen Vectors/Values of a matrix - 2

Lecture 8 - Programming Eigen Decomposition using Python

Lecture 9 - Singular Value Decomposition - 1

Lecture 10 - Singular Value Decomposition - 2

Lecture 11 - Principal Component Analysis - 1

Lecture 12 - Principal Component Analysis - 2

Lecture 13 - Principal Component Analysis - 3

Lecture 14 - Principal Component Analysis - Coding

Lecture 15 - Machine Learning - Overview

Lecture 16 - Optimisation Problems

Lecture 17 - Gradient of a Vector Valued Function - 1

Lecture 18 - Gradient of a Vector Valued Function - 2

Lecture 19 - Neural Netowrks - Overview

Lecture 20 - Neural Netowrks - Backpropagation

Lecture 21 - Optimisation - Introduction to optimisation problems

Lecture 22 - Optimisation - Relaxation and approximate convergence

Lecture 23 - Optimisation - First Order Optimality Condition

Lecture 24 - Optimisation - Second Order Optimality Condition

Lecture 25 - Proof of Second Order Optimality Condition, Gradient Methods

Lecture 26 - Gradient Descent - 2

Lecture 27 - Variants of Gradient Descent - 1

Lecture 28 - Variants of Gradient Descent - 2

Lecture 29 - Variants of Gradient Descent - 3

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Convex Sets
- Lecture 31 - Convex Functions
- Lecture 32 - Duality and Lagrangian - Part 1
- Lecture 33 - Duality and Lagrangian - Part 2
- Lecture 34 - Duality and Lagrangian - Part 3
- Lecture 35 - Coding: Introduction to Pytorch
- Lecture 36 - Guest Lectuer: Support Vector Machine

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - ACM India - RBCDSAI Summer School on DS-AI-ML

Subject Co-ordinator - Multi-Faculty

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to AI/ML/DS  
Lecture 2 - Introduction to Probability; Introduction to machine learning - Part 1  
Lecture 3 - Introduction to Probability; Introduction to machine learning - Part 2  
Lecture 4 - Introduction to Probability; Introduction to machine learning - Part 3  
Lecture 5 - Introduction to Probability; Introduction to machine learning - Part 4  
Lecture 6 - Python for AI/ML/DS - Part 1  
Lecture 7 - Python for AI/ML/DS - Part 2  
Lecture 8 - Descriptive statistics and Inferential statistics - Part 1  
Lecture 9 - Descriptive statistics and Inferential statistics - Part 2  
Lecture 10 - Descriptive statistics and Inferential statistics - Part 3  
Lecture 11 - Descriptive statistics and Inferential statistics - Part 4  
Lecture 12 - Descriptive statistics and Inferential statistics - Part 5  
Lecture 13 - Distribution, Data visualization, Plotting libraries - Part 1  
Lecture 14 - Distribution, Data visualization, Plotting libraries - Part 2  
Lecture 15 - Distribution, Data visualization, Plotting libraries - Part 3  
Lecture 16 - Linear Algebra for Data science  
Lecture 17 - Identification of linear relationship among attributes  
Lecture 18 - Solving Linear Equations - 1  
Lecture 19 - Solving Linear Equations - 2  
Lecture 20 - Linear Algebra - Distance, Hyperplanes and Halfspaces, Eigenvalues, Eigenvectors - Part 1  
Lecture 21 - Linear Algebra - Distance, Hyperplanes and Halfspaces, Eigenvalues, Eigenvectors - Part 2  
Lecture 22 - Linear Algebra - Part 1  
Lecture 23 - Linear Algebra - Part 2  
Lecture 24 - Linear Algebra - Part 3  
Lecture 25 - Regression Models, Models Selection and Evaluation - Part 1  
Lecture 26 - Regression Models, Models Selection and Evaluation - Part 2  
Lecture 27 - Regression Models, Models Selection and Evaluation - Part 3  
Lecture 28 - Regression Models, Models Selection and Evaluation - Part 4  
Lecture 29 - Regression - Part 1

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Regression - Part 2
- Lecture 31 - Regression - Part 3
- Lecture 32 - Classification Naive Bayes, Logistic Regression, K-NN - Part 1
- Lecture 33 - Classification Naive Bayes, Logistic Regression, K-NN - Part 2
- Lecture 34 - Classification Naive Bayes, Logistic Regression, K-NN - Part 3
- Lecture 35 - Classification Naive Bayes, Logistic Regression, K-NN - Part 4
- Lecture 36 - Classification - Part 1
- Lecture 37 - Classification - Part 2
- Lecture 38 - Classification - Part 3
- Lecture 39 - Linear Models for Classification - Part 1
- Lecture 40 - Linear Models for Classification - Part 2
- Lecture 41 - Kernel Machines
- Lecture 42 - Solving Langrange Dual in SVM
- Lecture 43 - Classification and SVM - Part 1
- Lecture 44 - Classification and SVM - Part 2
- Lecture 45 - Tree - Based methods, Boosting bagging - Part 1
- Lecture 46 - Tree - Based methods, Boosting bagging - Part 2
- Lecture 47 - Tree - Based methods, Boosting bagging - Part 3
- Lecture 48 - Tree - Based methods, Boosting bagging - Part 4
- Lecture 49 - Tree-based approaches for regression and classification - Part 1
- Lecture 50 - Tree-based approaches for regression and classification - Part 2
- Lecture 51 - Supervised Learning Using K Nearest Neighbors - Part 1
- Lecture 52 - Supervised Learning Using K Nearest Neighbors - Part 2
- Lecture 53 - Supervised Learning Using K Nearest Neighbors - Part 3
- Lecture 54 - Supervised Learning Using K Nearest Neighbors - Part 4
- Lecture 55 - Clustering methods - Part 1
- Lecture 56 - Clustering methods - Part 2
- Lecture 57 - Induction to Neural Networks, Perceptrons, Multilayer Perceptrons, Feedforward Neural Networks -
- Lecture 58 - Induction to Neural Networks, Perceptrons, Multilayer Perceptrons, Feedforward Neural Networks -
- Lecture 59 - Induction to Neural Networks, Perceptrons, Multilayer Perceptrons, Feedforward Neural Networks -
- Lecture 60 - Induction to Neural Networks, Perceptrons, Multilayer Perceptrons, Feedforward Neural Networks -
- Lecture 61 - Neural Networks and Feedforward NN - Part 1
- Lecture 62 - Neural Networks and Feedforward NN - Part 2
- Lecture 63 - Neural Networks and Feedforward NN - Part 3
- Lecture 64 - Backpropagation (Intuition)
- Lecture 65 - Backpropagation: Computing Cradients w.r.t the Output Units
- Lecture 66 - Learning Parameters: Gradient Descent
- Lecture 67 - Contours
- Lecture 68 - Nesterov Accelerated Gradient Descent

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Stochastic and Mini-Batch Gradient Descent
- Lecture 70 - Tips for Adjusting learning Rate and Momentum
- Lecture 71 - Line Search
- Lecture 72 - The convolution operation
- Lecture 73 - Convolutional Neural Networks
- Lecture 74 - CNN and DL models - Part 1
- Lecture 75 - CNN and DL models - Part 2
- Lecture 76 - CNN and DL models - Part 3
- Lecture 77 - CNN and DL models - Part 4
- Lecture 78 - AI/ML/DS Industry Use Cases - Part 1
- Lecture 79 - AI/ML/DS Industry Use Cases - Part 2
- Lecture 80 - AI/ML - Case Studies in Industry - Part 1
- Lecture 81 - AI/ML - Case Studies in Industry - Part 2
- Lecture 82 - Q and A on career in research a woman faculty representative from PSGTech and RBCDSAI

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Machine Learning (ML) in Hindi

Subject Co-ordinator - Prof. Anubha Gupta

Co-ordinating Institute - IIIT - Delhi

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Machine Learning
- Lecture 2 - Linear Algebra: Review (Vector Spaces)
- Lecture 3 - Linear Algebra: Review (Matrices)
- Lecture 4 - Probability Theory: Review (Basics of Probability)
- Lecture 5 - Probability Theory: Review (Random Variables)
- Lecture 6 - Linear Regression
- Lecture 7 - Linear Regression
- Lecture 8 - Tutorial: Linear Regression
- Lecture 9 - Linear Regression
- Lecture 10 - Linear Kernel Regression
- Lecture 11 - k-Nearest Neighbour (k-NN) Regression
- Lecture 12 - Tutorial: k-NN Regression
- Lecture 13 - Tutorial: Kernel Regression
- Lecture 14 - Logistic Regression: Classification Evaluation Metrics
- Lecture 15 - Logistic Regression
- Lecture 16 - Logistic Regression: Examples
- Lecture 17 - Tutorial: Logistic Regression
- Lecture 18 - Neural Networks
- Lecture 19 - Neural Networks
- Lecture 20 - Neural Networks: Examples
- Lecture 21 - Tutorial: Neural Networks
- Lecture 22 - Practical Machine Learning - Part 1
- Lecture 23 - Practical Machine Learning - Part 2
- Lecture 24 - Practical Machine Learning - Part 3
- Lecture 25 - Practical Machine Learning - Part 4
- Lecture 26 - Support Vector Machines (SVM)
- Lecture 27 - Tutorial: Support Vector Machines (SVM)
- Lecture 28 - Kernel Support Vector Machines (k-SVM)
- Lecture 29 - Naïve Bayes Classification

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Decision Trees - Part 1
- Lecture 31 - Decision Trees - Part 2
- Lecture 32 - Tutorial: Naive Bayes Classification
- Lecture 33 - Tutorial: Decision Trees
- Lecture 34 - k-NN Classifier
- Lecture 35 - Ensemble Learning
- Lecture 36 - Random Forests
- Lecture 37 - Bagging (Bootstrap AGGregatING)
- Lecture 38 - Tutorial: Random Forests
- Lecture 39 - Tutorial: k-NN Classifier and Bootstrap AGGregatING (Bagging)
- Lecture 40 - Boosting
- Lecture 41 - Clustering
- Lecture 42 - k-means Clustering
- Lecture 43 - Tutorial: Boosting
- Lecture 44 - Spectral Clustering
- Lecture 45 - Mixture of Models (Gaussian Mixture Models-GMM)
- Lecture 46 - Dimensionality Reduction: Principal Component Analysis (PCA) and kernel PCA
- Lecture 47 - Tutorial: k-means and Spectral Clustering
- Lecture 48 - Tutorial: Principal Component Analysis (PCA) and Gaussian Mixture Models (GMM)
- Lecture 49 - Introduction to Deep Learning (DL)
- Lecture 50 - Convolutional Neural Networks (CNN) - Part A
- Lecture 51 - Convolutional Neural Networks (CNN) - Part B
- Lecture 52 - Autoencoders
- Lecture 53 - Applications of ML in Healthcare Problems - Part 1
- Lecture 54 - Applications of ML in Healthcare Problems - Part 2
- Lecture 55 - Tutorial: CNN and Autoencoder

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC: Cyber Security and Privacy

Subject Co-ordinator - Prof. Saji K Mathew

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction - Part 1  
Lecture 2 - Introduction - Part 2  
Lecture 3 - Introduction - Part 3  
Lecture 4 - Foundations - Part 1  
Lecture 5 - Foundations - Part 2  
Lecture 6 - Foundations - Part 3  
Lecture 7 - Security management, GRC - Part 1  
Lecture 8 - Security management, GRC - Part 2  
Lecture 9 - Security management, GRC - Part 3  
Lecture 10 - Contingency planning - Part 1  
Lecture 11 - Contingency Planning - Part 2  
Lecture 12 - Contingency Planning - Part 3  
Lecture 13 - Cybersecurity policy - Part 1  
Lecture 14 - Cybersecurity policy - Part 2  
Lecture 15 - Cybersecurity policy - Part 3  
Lecture 16 - Risk Management - Part 1  
Lecture 17 - Risk Management - Part 2  
Lecture 18 - Risk Management - Part 3  
Lecture 19 - Cybersecurity: Industry perspective - Part 1  
Lecture 20 - Cybersecurity: Industry perspective - Part 2  
Lecture 21 - Cybersecurity: Industry perspective - Part 3  
Lecture 22 - Cyber security technologies - Part 1  
Lecture 23 - Cyber security technologies - Part 2  
Lecture 24 - Cyber security technologies - Part 3  
Lecture 25 - Foundations of privacy - Part 1  
Lecture 26 - Foundations of privacy - Part 2  
Lecture 27 - Foundations of privacy - Part 3  
Lecture 28 - Privacy regulation - Part 1  
Lecture 29 - Privacy regulation - Part 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Privacy regulation - Part 3
- Lecture 31 - Privacy regulation in Europe - Part 1
- Lecture 32 - Privacy regulation in Europe - Part 2
- Lecture 33 - Privacy regulation in Europe - Part 3
- Lecture 34 - Privacy: The Indian Way - Part 1
- Lecture 35 - Privacy: The Indian Way - Part 2
- Lecture 36 - Privacy: The Indian Way - Part 3
- Lecture 37 - Information privacy: Economics and strategy - Part 1
- Lecture 38 - Information privacy: Economics and strategy - Part 2
- Lecture 39 - Information privacy: Economics and strategy - Part 3
- Lecture 40 - Privacy: Strategy and safety - Part 1
- Lecture 41 - Privacy: Strategy and safety - Part 2
- Lecture 42 - Privacy: Strategy and safety - Part 3

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Business Intelligence and Analytics

Subject Co-ordinator - Prof. Saji K Mathew

Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Business Intelligence and Analytics
- Lecture 2 - Patterns in Data
- Lecture 3 - Vocabulary of Business Analytics
- Lecture 4 - Course Overview
- Lecture 5 - Case: Bizocity Scoring at AT&T
- Lecture 6 - Business Intelligence Architecture
- Lecture 7 - Data Management
- Lecture 8 - Online Transaction Processing
- Lecture 9 - Introduction To SQL
- Lecture 10 - Normalisation
- Lecture 11 - Shopsense Case in MySQL Workbench
- Lecture 12 - Online Analytical Processing
- Lecture 13 - Descriptive Data Analytics
- Lecture 14 - Churn Analysis
- Lecture 15 - Customer Lifetime Value
- Lecture 16 - NPV-CLV Spreadsheet Analysis
- Lecture 17 - Analytics Process
- Lecture 18 - Introduction to Statistical Learning and Data Pre-Processing
- Lecture 19 - Data Mining Process
- Lecture 20 - Overview of Data Mining Techniques
- Lecture 21 - Analytics Process Case
- Lecture 22 - Introduction to Classification
- Lecture 23 - Scoring Models
- Lecture 24 - Classifier Performance
- Lecture 25 - Decision Trees
- Lecture 26 - Attribute Selection
- Lecture 27 - Growing a Decision Tree
- Lecture 28 - Decision Tree Application - Part 1
- Lecture 29 - Decision Tree Application - Part 2

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Classification Demo - 1
- Lecture 31 - Classification Demo - 2
- Lecture 32 - Cluster Analysis
- Lecture 33 - Clustering Techniques - Part 1
- Lecture 34 - Clustering Techniques - Part 2
- Lecture 35 - K-Means Clustering
- Lecture 36 - Implementation in Python: Clustering for segmentation and profiling
- Lecture 37 - RFM Analysis
- Lecture 38 - Trendhub Case on RFM
- Lecture 39 - RFM and Clustering
- Lecture 40 - Artificial Neural Network
- Lecture 41 - ANN Training
- Lecture 42 - ANN for Financial Time Series Modelling
- Lecture 43 - Implementation in Python: ANN
- Lecture 44 - Introduction Text Mining
- Lecture 45 - Text Mining Process
- Lecture 46 - Text mining Using R - The Case of a Movie Discussion Forum

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Responsible and Safe AI Systems

Subject Co-ordinator - Prof. Ponnurangam Kumaraguru, Prof. Balaraman Ravindran, Prof. Arun Rajkumar

Co-ordinating Institute - IIITH and IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction  
Lecture 2 - AI Capabilities - Part 1  
Lecture 3 - AI Capabilities - Part 2  
Lecture 4 - AI Risk - Part 1  
Lecture 5 - AI Risk - Part 2  
Lecture 6 - AI Risk - Part 3  
Lecture 7 - AI Risk Part 4 "Risks associated with AI, getting harmful outputs from AI, biases  
Lecture 8 - Robustness - Part 1  
Lecture 9 - Robustness - Part 2  
Lecture 10 - Robustness Hands-On  
Lecture 11 - RLHF  
Lecture 12 - AI Alignment  
Lecture 13 - Transformers - Part 1  
Lecture 14 - Transformers - Part 2  
Lecture 15 - Hugging face  
Lecture 16 - Unlearning  
Lecture 17 - Approximate unlearning  
Lecture 18 - Evaluation of Unlearning and Graph Unlearning - Part 1  
Lecture 19 - Evaluation of Unlearning and Graph Unlearning - Part 2  
Lecture 20 - Representation Engineering - Hands on  
Lecture 21 - Introduction to ML - Part 1  
Lecture 22 - Introduction to ML - Part 2  
Lecture 23 - Basics of Neural Networks and PyTorch - Part 1  
Lecture 24 - Basics of Neural Networks and PyTorch - Part 2  
Lecture 25 - PyTorch - Basic Workflow  
Lecture 26 - PyTorch - Classification  
Lecture 27 - Bias - I  
Lecture 28 - Bias - II  
Lecture 29 - Source of Bias

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- Lecture 30 - Bias - Handson
- Lecture 31 - Bias - III
- Lecture 32 - Bias - IV
- Lecture 33 - Bias in VLM's
- Lecture 34 - Bias Handson - Part 1
- Lecture 35 - Bias Handson - Part 2
- Lecture 36 - Data Privacy
- Lecture 37 - Differential Privacy
- Lecture 38 - Approximate Differential Privacy
- Lecture 39 - Exponential Mechanism
- Lecture 40 - Fairness in Machine Learning
- Lecture 41 - Interpretability - I
- Lecture 42 - Interpretability - II
- Lecture 43 - Interpretability Hands-on - Part 1
- Lecture 44 - Interpretability Hands-on - Part 2
- Lecture 45 - AI Policies, Regulations, AGI - Part 1
- Lecture 46 - AI Policies, Regulations, AGI - Part 2
- Lecture 47 - AI Policies, Regulations, AGI - Part 3
- Lecture 48 - AI Policies, AGI with Prof. David Krueger - Part 1
- Lecture 49 - AI Policies, AGI with Prof. David Krueger - Part 2
- Lecture 50 - Finetuning and Jailbreaking: Hands-on
- Lecture 51 - AI Governance
- Lecture 52 - Research Overview: SaGE- Quantifying moral consistency in LLMs
- Lecture 53 - Research Overview: Higher Order Structures for Graph Explanations
- Lecture 54 - Research Overview: Representation Surgery
- Lecture 55 - Summary - Part 1
- Lecture 56 - Summary - Part 2

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Cryptology

Subject Co-ordinator - Dr. Sugata Gangopadhyay

Co-ordinating Institute - IIT - Roorkee

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction Caesar cipher
- Lecture 2 - Modular arithmetic, shift cipher
- Lecture 3 - Affine Cipher, Vigenere Cipher
- Lecture 4 - Perfect secrecy, Application of Shift Cipher
- Lecture 5 - Problem Discussion on Affine cipher and Perfect Secrecy
- Lecture 6 - Product Cipher, Block Cipher, Modes of Operation for Block Cipher
- Lecture 7 - Substitution Permutation network, Feistel Cipher
- Lecture 8 - S-Box Theory
- Lecture 9 - Cryptanalysis and its Variants, Linear Attack
- Lecture 10 - Problem Discussion
- Lecture 11 - Public Key Cryptology Introduction RSA Cryptosystem
- Lecture 12 - Complexity analysis of Euclidian Algorithm and RSA Cryptosystem square and multiply algorithm
- Lecture 13 - Primality testing
- Lecture 14 - Efficient Computation of Jacobi Symbol Primality Testing
- Lecture 15 - Problem Discussion on Jacobi Symbol Calculation and RSA Cryptosystem
- Lecture 16 - Cryptographic hash function
- Lecture 17 - Random Oracle model, Security of hash functions
- Lecture 18 - Randomized Algorithm and its application on Preimage resistance and collision resistance
- Lecture 19 - Iterated Hash Functions
- Lecture 20 - Problem Discussion

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Data Analytics with Python

Subject Co-ordinator - Prof. A. Ramesh

Co-ordinating Institute - IIT - Roorkee

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to data analytics  
Lecture 2 - Python Fundamentals - I  
Lecture 3 - Python Fundamentals - II  
Lecture 4 - Central Tendency and Dispersion - I  
Lecture 5 - Central Tendency and Dispersion - II  
Lecture 6 - Introduction to Probability - I  
Lecture 7 - Introduction to Probability - II  
Lecture 8 - Probability Distributions - I  
Lecture 9 - Probability Distributions - II  
Lecture 10 - Probability Distributions - III  
Lecture 11 - Python Demo for Distributions  
Lecture 12 - Sampling and Sampling Distribution  
Lecture 13 - Distribution of Sample Means, population, and variance  
Lecture 14 - Confidence interval estimation  
Lecture 15 - Confidence interval estimation  
Lecture 16 - Hypothesis Testing - I  
Lecture 17 - Hypothesis Testing - II  
Lecture 18 - Hypothesis Testing - III  
Lecture 19 - Errors in Hypothesis Testing  
Lecture 20 - Hypothesis Testing  
Lecture 21 - Hypothesis Testing  
Lecture 22 - Hypothesis Testing  
Lecture 23 - ANOVA - I  
Lecture 24 - ANOVA - II  
Lecture 25 - Post Hoc Analysis (Tukey's test)  
Lecture 26 - Randomize block design (RBD)  
Lecture 27 - Two Way ANOVA  
Lecture 28 - Linear Regression - I  
Lecture 29 - Linear Regression - II

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Linear Regression - III
- Lecture 31 - Estimation, Prediction of Regression Model Residual Analysis - I
- Lecture 32 - Estimation, Prediction of Regression Model Residual Analysis - II
- Lecture 33 - Multiple Regression Model - I
- Lecture 34 - Multiple Regression Model - II
- Lecture 35 - Categorical variable regression
- Lecture 36 - Maximum Likelihood Estimation - I
- Lecture 37 - Maximum Likelihood Estimation - II
- Lecture 38 - Logistic Regression - I
- Lecture 39 - Logistic Regression - II
- Lecture 40 - Linear Regression Model Vs Logistic Regression Model
- Lecture 41 - Confusion matrix and ROC - I
- Lecture 42 - Confusion Matrix and ROC - II
- Lecture 43 - Performance of Logistic Model - III
- Lecture 44 - Regression Analysis Model Building - I
- Lecture 45 - Regression Analysis Model Building (Interaction) - II
- Lecture 46 - Chi - Square Test of Independence - I
- Lecture 47 - Chi-Square Test of Independence - II
- Lecture 48 - Chi-Square Goodness of Fit Test
- Lecture 49 - Cluster analysis
- Lecture 50 - Clustering analysis - Part II
- Lecture 51 - Clustering analysis - Part III
- Lecture 52 - Cluster analysis - Part IV
- Lecture 53 - Cluster analysis - Part V
- Lecture 54 - K- Means Clustering
- Lecture 55 - Hierarchical method of clustering - I
- Lecture 56 - Hierarchical method of clustering - II
- Lecture 57 - Classification and Regression Trees (CART) - I
- Lecture 58 - Measures of attribute selection
- Lecture 59 - Attribute selection Measures in (CART) - II
- Lecture 60 - Classification and Regression Trees (CART) - III



# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Combinatorics

Subject Co-ordinator - Dr. L. Sunil Chandran

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Pigeon hole principle - (Part 1)
- Lecture 2 - Pigeon hole principle - (Part 2)
- Lecture 3 - Pigeon hole principle - (Part 3)
- Lecture 4 - Pigeon hole principle - (Part 4)
- Lecture 5 - Elementary concepts and basic counting principles
- Lecture 6 - Elementary concepts; Binomial theorem; Bijective proofs - Part (1)
- Lecture 7 - Bijective proofs â Part (2)
- Lecture 8 - Bijective proofs - Part (3); Properties of binomial coefficients; Combinatorial identities - Part (1)
- Lecture 9 - Combinatorial identities - Part (2); Permutations of multisets â Part (1)
- Lecture 10 - Permutations of multisets â Part (2)
- Lecture 11 - Multinomial Theorem, Combinations of Multisets â Part (1)
- Lecture 12 - Combinations of Multisets - Part (2)
- Lecture 13 - Combinations of Multisets â Part (3), Bounds for binomial coefficients
- Lecture 14 - Sterlingâ s Formula, Generalization of Binomial coefficients - Part (1)
- Lecture 15 - Generalization of Binomial coefficients - Part (2)
- Lecture 16 - Generalization of Binomial coefficients - Part (3); Double counting - Part (1)
- Lecture 17 - Double counting - Part (2)
- Lecture 18 - Hallâ s Theorem for regular bipartite graphs; Inclusion exclusion principle - Part (1)
- Lecture 19 - Inclusion exclusion principle - Part (2)
- Lecture 20 - Inclusion exclusion principle - Part (3)
- Lecture 21 - Inclusion exclusion principle - Part (4)
- Lecture 22 - Inclusion exclusion principle - Part (5)
- Lecture 23 - Recurrence Relations - Part (1)
- Lecture 24 - Recurrence Relations - Part (2)
- Lecture 25 - Recurrence Relations - Part (3)
- Lecture 26 - Recurrence Relations - Part (4)
- Lecture 27 - Recurrence Relations - Part (5)
- Lecture 28 - Generating functions - Part (1)
- Lecture 29 - Generating functions - Part (2)

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Solving recurrence relations using generating functions - Part (1)
- Lecture 31 - Solving recurrence relations using generating functions - Part (2)
- Lecture 32 - Exponential generating functions - Part (1)
- Lecture 33 - Exponential generating functions - Part (2), Partition Number - Part (1)
- Lecture 34 - Partition Number - Part (2)
- Lecture 35 - Partition Number - Part (3)
- Lecture 36 - Partition Number - Part (4); Catalan Numbers - Part (1)
- Lecture 37 - Catalans Numbers - Part (2)
- Lecture 38 - Catalan Numbers - Part (3), Sterling numbers of the 2nd kind
- Lecture 39 - Difference Sequences
- Lecture 40 - Sterling Numbers
- Lecture 41 - Summary

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Compiler Design (Prof. Y.N. Srikanth)

Subject Co-ordinator - Prof. Y.N. Srikanth

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - An Overview of a Compiler - Part 1

Lecture 2 - An Overview of a Compiler - Part 2 and Run-Time Environments - Part 1

Lecture 3 - An Overview of a Compiler - Part 2 and Run-Time Environments - Part 1

Lecture 4 - Run-Time Environments - Part 2

Lecture 5 - Run-Time Environments - Part 3 and Local Optimizations - Part 1

Lecture 6 - Run-Time Environments - Part 3 and Local Optimizations - Part 1

Lecture 7 - Local Optimizations - Part 2 and Code Generation - Part 1

Lecture 8 - Local Optimizations - Part 2 and Code Generation - Part 1

Lecture 9 - Code Generation - Part 1

Lecture 10 - Code Generation - Part 2

Lecture 11 - Code Generation - Part 3 and Global Register Allocation - Part 1

Lecture 12 - Code Generation - Part 3 and Global Register Allocation - Part 1

Lecture 13 - Global Register Allocation - Part 2

Lecture 14 - Global Register Allocation - Part 3 and Implementing Object-Oriented Languages - Part 1

Lecture 15 - Global Register Allocation - Part 3 and Implementing Object-Oriented Languages - Part 1

Lecture 16 - Implementing Object-Oriented Languages - Part 2 and Introduction to Machine-Independent Optimizations

Lecture 17 - Implementing Object-Oriented Languages - Part 2 and Introduction to Machine-Independent Optimizations

Lecture 18 - Introduction to Machine-Independent Optimizations - Part 2 and Data-Flow Analysis - Part 1

Lecture 19 - Introduction to Machine-Independent Optimizations - Part 2 and Data-Flow Analysis - Part 1

Lecture 20 - Data-Flow Analysis - Part 2

Lecture 21 - Data-Flow Analysis - Part 3 and Control-Flow Analysis - Part 1

Lecture 22 - Data-Flow Analysis - Part 3 and Control-Flow Analysis - Part 1

Lecture 23 - Control-Flow Analysis - Part 2

Lecture 24 - Machine-Independent Optimizations - Part 1

Lecture 25 - Machine-Independent Optimizations - Part 2

Lecture 26 - Machine-Independent Optimizations - Part 3 and Data-Flow Analysis

Lecture 27 - Machine-Independent Optimizations - Part 3 and Data-Flow Analysis

Lecture 28 - Data-Flow Analysis

Lecture 29 - Data-Flow Analysis

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Partial Redundancy Elimination - Part 2
- Lecture 31 - The Static Single Assignment Form
- Lecture 32 - The Static Single Assignment Form
- Lecture 33 - The Static Single Assignment Form
- Lecture 34 - Automatic Parallelization - Part 1
- Lecture 35 - Automatic Parallelization - Part 2
- Lecture 36 - Automatic Parallelization - Part 3
- Lecture 37 - Automatic Parallelization - Part 4
- Lecture 38 - Instruction Scheduling - Part 1
- Lecture 39 - Instruction Scheduling - Part 2
- Lecture 40 - Instruction Scheduling - Part 3
- Lecture 41 - Software Pipelining
- Lecture 42 - Energy-Aware Software Systems - Part 1
- Lecture 43 - Energy-Aware Software Systems - Part 2
- Lecture 44 - Energy-Aware Software Systems - Part 3
- Lecture 45 - Energy-Aware Software Systems - Part 4
- Lecture 46 - Just-In-Time Compilation and Optimizations for .NET CLR
- Lecture 47 - Garbage Collection
- Lecture 48 - Interprocedural Data-Flow Analysis
- Lecture 49 - Worst Case Execution Time - Part 1
- Lecture 50 - Worst Case Execution Time - Part 2

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Graph Theory

Subject Co-ordinator - Dr. L. Sunil Chandran

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction

Lecture 2 - Matchings

Lecture 3 - More on Hall's theorem and some applications

Lecture 4 - Tutte's theorem on existence of a perfect matching

Lecture 5 - More on Tutte's theorem

Lecture 6 - More on Matchings

Lecture 7 - Dominating set, path cover

Lecture 8 - Gallai's Millgram theorem, Dilworth's theorem

Lecture 9 - Connectivity

Lecture 10 - Menger's theorem

Lecture 11 - More on connectivity

Lecture 12 - Minors, topological minors and more on k-linkedness

Lecture 13 - Vertex coloring

Lecture 14 - More on vertex coloring

Lecture 15 - Edge coloring

Lecture 16 - Proof of Vizing's theorem, Introduction to planarity

Lecture 17 - 5-coloring planar graphs, Kuratowski's theorem

Lecture 18 - Proof of Kuratowski's theorem, List coloring

Lecture 19 - List chromatic index

Lecture 20 - Adjacency polynomial of a graph and combinatorial Nullstellensatz

Lecture 21 - Chromatic polynomial, k-critical graphs

Lecture 22 - Gallai-Roy theorem, Acyclic coloring, Hadwiger's conjecture

Lecture 23 - Perfect graphs

Lecture 24 - Interval graphs, chordal graphs

Lecture 25 - Proof of weak perfect graph theorem (WPGT)

Lecture 26 - Second proof of WPGT, Some non-perfect graph classes

Lecture 27 - More special classes of graphs

Lecture 28 - Boxicity, Sphericity, Hamiltonian circuits

Lecture 29 - More on Hamiltonicity

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Chvatal's theorem, toughness, Hamiltonicity and 4-color conjecture
- Lecture 31 - Network flows
- Lecture 32 - More on network flows
- Lecture 33 - Circulations and tensions
- Lecture 34 - More on circulations and tensions, flow number and Tutte's flow conjectures
- Lecture 35 - Random graphs and probabilistic method
- Lecture 36 - Probabilistic method
- Lecture 37 - Probabilistic method
- Lecture 38 - Probabilistic method
- Lecture 39 - Graph minors and Hadwiger's conjecture
- Lecture 40 - More on graph minors, tree decompositions

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - High Performance Computing

Subject Co-ordinator - Prof. Mathew Jacob

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Programs and Data  
Lecture 2 - Data Representation  
Lecture 3 - Registers and Memory  
Lecture 4 - Instructions, Addressing Modes  
Lecture 5 - A RISC Instruction Set  
Lecture 6 - A RISC Instruction Set (Continued...)  
Lecture 7 - Function Call and Return  
Lecture 8 - Function Call and Return (Continued...)  
Lecture 9 - Instruction Execution  
Lecture 10 - Instruction Execution (Continued...)  
Lecture 11 - Software organization  
Lecture 12 - System Calls  
Lecture 13 - Virtual memory  
Lecture 14 - Virtual memory (Continued...)  
Lecture 15 - Virtual Memory (Continued...)  
Lecture 16 - Process  
Lecture 17 - Process scheduling  
Lecture 18 - Process lifetime  
Lecture 19 - Interprocess communication  
Lecture 20 - Concurrent programming  
Lecture 21 - Pipelining  
Lecture 22 - Pipeline hazards  
Lecture 23 - Pipeline hazards (Continued...)  
Lecture 24 - Pipeline hazards (Continued...)  
Lecture 25 - Cache memory  
Lecture 26 - Memory hierarchy  
Lecture 27 - Cache operation  
Lecture 28 - Cache operation (Continued)  
Lecture 29 - Cache aware programming

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Cache aware programming (Continued...)
- Lecture 31 - More on cache
- Lecture 32 - Measuring time
- Lecture 33 - Program Profiling
- Lecture 34 - Secondary storage
- Lecture 35 - Files and disks
- Lecture 36 - Directories
- Lecture 37 - Protection and Performance
- Lecture 38 - Parallel architecture
- Lecture 39 - Cache coherence
- Lecture 40 - MPI programming
- Lecture 41 - MPI programming (Continued...)



# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Numerical Optimization

Subject Co-ordinator - Dr. Shirish K. Shevade

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction
- Lecture 2 - Mathematical Background
- Lecture 3 - Mathematical Background (Continued...)
- Lecture 4 - One Dimensional Optimization - Optimality Conditions
- Lecture 5 - One Dimensional Optimization (Continued...)
- Lecture 6 - Convex Sets
- Lecture 7 - Convex Sets (Continued...)
- Lecture 8 - Convex Functions
- Lecture 9 - Convex Functions (Continued...)
- Lecture 10 - Multi Dimensional Optimization - Optimality Conditions, Conceptual Algorithm
- Lecture 11 - Line Search Techniques
- Lecture 12 - Global Convergence Theorem
- Lecture 13 - Steepest Descent Method
- Lecture 14 - Classical Newton Method
- Lecture 15 - Trust Region and Quasi-Newton Methods
- Lecture 16 - Quasi-Newton Methods - Rank One Correction, DFP Method
- Lecture 17 - i) Quasi-Newton Methods - Broyden Family ii) Coordinate Descent Method
- Lecture 18 - Conjugate Directions
- Lecture 19 - Conjugate Gradient Method
- Lecture 20 - Constrained Optimization - Local and Global Solutions, Conceptual Algorithm
- Lecture 21 - Feasible and Descent Directions
- Lecture 22 - First Order KKT Conditions
- Lecture 23 - Constraint Qualifications
- Lecture 24 - Convex Programming Problem
- Lecture 25 - Second Order KKT Conditions
- Lecture 26 - Second Order KKT Conditions (Continued...)
- Lecture 27 - Weak and Strong Duality
- Lecture 28 - Geometric Interpretation
- Lecture 29 - Lagrangian Saddle Point and Wolfe Dual

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Linear Programming Problem
- Lecture 31 - Geometric Solution
- Lecture 32 - Basic Feasible Solution
- Lecture 33 - Optimality Conditions and Simplex Tableau
- Lecture 34 - Simplex Algorithm and Two-Phase Method
- Lecture 35 - Duality in Linear Programming
- Lecture 36 - Interior Point Methods - Affine Scaling Method
- Lecture 37 - Karmarkar's Method
- Lecture 38 - Lagrange Methods, Active Set Method
- Lecture 39 - Active Set Method (Continued...)
- Lecture 40 - Barrier and Penalty Methods, Augmented Lagrangian Method and Cutting Plane Method
- Lecture 41 - Summary

# NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Storage Systems

Subject Co-ordinator - Dr. K. Gopinath

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Overview
- Lecture 2 - Storage, Processing, Networking
- Lecture 3 - Naming and Storing
- Lecture 4 - Storage Filesystems
- Lecture 5 - Access Architecture, Hard Disks
- Lecture 6 - SCSI
- Lecture 7 - Fibre Channel Protocol (FCP)
- Lecture 8 - FCP, 10Gb Ethernet, iSCSI, TCP
- Lecture 9 - NFS, NFSv2
- Lecture 10 - NFSv2, NFSv3, NFSv4, CIFS
- Lecture 11 - USB Storage
- Lecture 12 - Tiering
- Lecture 13 - Mobile/Personal/Organizational - type Storage
- Lecture 14 - Parallel/Cloud/Web-scale Storage
- Lecture 15 - Long-term Storage
- Lecture 16 - Storage interfaces
- Lecture 17 - User-Memory-CPU interactions
- Lecture 18 - Spinlock, Concurrency
- Lecture 19 - Block Layer design
- Lecture 20 - FAT, TFAT, F2FS, LFS, FTL
- Lecture 21 - Data Structures
- Lecture 22 - Abstractions
- Lecture 23 - Link & Write Operations
- Lecture 24 - ZFS
- Lecture 25 - RAID in Filesystems
- Lecture 26 - RAID-Z, NetApp RAID4, Flash Filesystems
- Lecture 27 - Reliability
- Lecture 28 - Performance
- Lecture 29 - Security

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - CAP Theorem
- Lecture 31 - POSIX/NFS/S3/Zookeeper, ACID Vs. BASE
- Lecture 32 - Consistency & Commit problems
- Lecture 33 - Paxos
- Lecture 34 - Group Communication problem
- Lecture 35 - Message Ordering
- Lecture 36 - Ordering Models
- Lecture 37 - Orderings in Filesystems
- Lecture 38 - Semantics of highly scalable filesystems
- Lecture 39 - GFS
- Lecture 40 - GFS Model
- Lecture 41 - GFS functions and operations
- Lecture 42 - GFS problems, BigTable
- Lecture 43 - Lessons to learn

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - System Analysis and Design

Subject Co-ordinator - Prof. V. Rajaraman

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture - 1  
Lecture - 2  
Lecture - 3  
Lecture - 4  
Lecture - 5  
Lecture - 6  
Lecture - 7  
Lecture - 8  
Lecture - 9  
Lecture - 10  
Lecture - 11  
Lecture - 12  
Lecture - 13  
Lecture - 14  
Lecture - 15  
Lecture - 16  
Lecture - 17  
Lecture - 18  
Lecture - 19  
Lecture - 20  
Lecture - 21  
Lecture - 22  
Lecture - 23  
Lecture - 24  
Lecture - 25  
Lecture - 26  
Lecture - 27  
Lecture - 28  
Lecture - 29

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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Lecture - 30  
Lecture - 31  
Lecture - 32  
Lecture - 33  
Lecture - 34  
Lecture - 35  
Lecture - 36  
Lecture - 37  
Lecture - 38  
Lecture - 39  
Lecture - 40

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - Principles of Compiler Design

Subject Co-ordinator - Prof. Y.N. Srikanth

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - An Overview of a Compiler  
Lecture 2 - Lexical Analysis - Part 1  
Lecture 3 - Lexical Analysis - Part 2  
Lecture 4 - Lexical Analysis - Part 3  
Lecture 5 - Syntax Analysis  
Lecture 6 - Syntax Analysis  
Lecture 7 - Syntax Analysis  
Lecture 8 - Syntax Analysis  
Lecture 9 - Syntax Analysis  
Lecture 10 - Syntax Analysis  
Lecture 11 - Syntax Analysis  
Lecture 12 - Semantic Analysis with Attribute Grammars Part - 1  
Lecture 13 - Semantic Analysis with Attribute Grammars Part - 2  
Lecture 14 - Semantic Analysis with Attribute Grammars Part - 3  
Lecture 15 - Semantic Analysis with Attribute Grammars Part - 4  
Lecture 16 - Semantic Analysis with Attribute Grammars Part - 5  
Lecture 17 - Intermediate code generation Part - 1  
Lecture 18 - Intermediate code generation Part - 2  
Lecture 19 - Intermediate code generation Part - 3  
Lecture 20 - Intermediate code generation Part - 4 (first half of lecture)  
Lecture 21 - Run-time environments - 1 (second half of lecture)  
Lecture 22 - Run-time environments - 2  
Lecture 23 - Run-time environments - 3  
Lecture 24 - Run-time environments - 4 (first half of lecture)  
Lecture 25 - Control-Flow Graph and Local Optimizations - Part 1 (second half of lecture)  
Lecture 26 - Control-Flow Graph and Local Optimizations - Part 2 (first half of lecture)  
Lecture 27 - Machine code generation - 1 (second half of lecture)  
Lecture 28 - Machine code generation - 2  
Lecture 29 - Machine code generation - 3

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Machine code generation - 4 (first half of lecture), Implementing object-oriented languages 1 (s
- Lecture 31 - Implementing object-oriented languages 2 (first half of lecture)
- Lecture 32 - Global register allocation - 1 (second half of lecture)
- Lecture 33 - Global register allocation - 2
- Lecture 34 - Global register allocation - 3
- Lecture 35 - Introduction to Machine-Independent Optimizations - 1
- Lecture 36 - Introduction to Machine-Independent Optimizations - 2
- Lecture 37 - Introduction to Machine-Independent Optimizations - 3
- Lecture 38 - Introduction to Machine-Independent Optimizations - 4
- Lecture 39 - Introduction to Machine-Independent Optimizations - 5
- Lecture 40 - Introduction to Machine-Independent Optimizations - 6
- Lecture 41 - Introduction to Machine-Independent Optimizations - 7 (first half of lecture)
- Lecture 42 - Instruction Scheduling and Software Pipelining - 1 (second half of lecture)
- Lecture 43 - Instruction Scheduling and Software Pipelining - 2
- Lecture 44 - Instruction Scheduling and Software Pipelining - 3 (first part of lecture)
- Lecture 45 - Automatic parallelization - 1 (second half of lecture)
- Lecture 46 - Automatic parallelization - 2



## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Discrete Mathematics (IIITB)

Subject Co-ordinator - Prof. Ashish Choudhury

Co-ordinating Institute - IIIT - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to Mathematical Logic  
Lecture 2 - Logical Equivalence  
Lecture 3 - SAT Problem  
Lecture 4 - Rules of Inference  
Lecture 5 - Resolution  
Lecture 6 - Tutorial 1 - Part I  
Lecture 7 - Tutorial 1 - Part II  
Lecture 8 - Predicate Logic  
Lecture 9 - Rules of Inferences in Predicate Logic  
Lecture 10 - Proof Strategies - I  
Lecture 11 - Proof Strategies - II  
Lecture 12 - Induction  
Lecture 13 - Tutorial 2 - Part I  
Lecture 14 - Tutorial 2 - Part II  
Lecture 15 - Sets  
Lecture 16 - Relations  
Lecture 17 - Operations on Relations  
Lecture 18 - Transitive Closure of Relations  
Lecture 19 - Warshall's Algorithm for Computing Transitive Closure  
Lecture 20 - Tutorial - 3  
Lecture 21 - Equivalence Relation  
Lecture 22 - Equivalence Relations and Partitions  
Lecture 23 - Partial Ordering  
Lecture 24 - Functions  
Lecture 25 - Tutorial 4 - Part I  
Lecture 26 - Tutorial 4 - Part II  
Lecture 27 - Countable and Uncountable Sets  
Lecture 28 - Examples of Countably Infinite Sets  
Lecture 29 - Cantor's Diagonalization Argument

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Uncomputable Functions
- Lecture 31 - Tutorial - 5
- Lecture 32 - Basic Rules of Counting
- Lecture 33 - Permutation and Combination
- Lecture 34 - Counting Using Recurrence Equations
- Lecture 35 - Solving Linear Homogeneous Recurrence Equations - Part I
- Lecture 36 - Solving Linear Homogeneous Recurrence Equations - Part II
- Lecture 37 - Tutorial 6 - Part I
- Lecture 38 - Tutorial 6 - Part II
- Lecture 39 - Solving Linear Non-Homogeneous Recurrence Equations
- Lecture 40 - Catalan Numbers
- Lecture 41 - Catalan Numbers - Derivation of Closed Form Formula
- Lecture 42 - Counting Using Principle of Inclusion-Exclusion
- Lecture 43 - Tutorial - 7
- Lecture 44 - Graph Theory Basics
- Lecture 45 - Matching
- Lecture 46 - Proof of Hall's Marriage Theorem
- Lecture 47 - Various Operations on Graphs
- Lecture 48 - Vertex and Edge Connectivity
- Lecture 49 - Tutorial - 8
- Lecture 50 - Euler Path and Euler Circuit
- Lecture 51 - Hamiltonian Circuit
- Lecture 52 - Vertex and Edge Coloring
- Lecture 53 - Tutorial 9 - Part I
- Lecture 54 - Tutorial 9 - Part II
- Lecture 55 - Modular Arithmetic
- Lecture 56 - Prime Numbers and GCD
- Lecture 57 - Properties of GCD and Bézout's Theorem
- Lecture 58 - Linear Congruence Equations and Chinese Remainder Theorem
- Lecture 59 - Uniqueness Proof of the CRT
- Lecture 60 - Fermat's Little Theorem, Primality Testing and Carmichael Numbers
- Lecture 61 - Group Theory
- Lecture 62 - Cyclic Groups
- Lecture 63 - Subgroups
- Lecture 64 - Discrete Logarithm and Cryptographic Applications
- Lecture 65 - More Applications of Groups
- Lecture 66 - Rings, Fields and Polynomials
- Lecture 67 - Polynomials Over Fields and Properties
- Lecture 68 - Finite Fields and Properties - I

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 69 - Finite Fields and Properties - II
- Lecture 70 - Primitive Element of a Finite Field
- Lecture 71 - Applications of Finite Fields
- Lecture 72 - Goodbye and Farewell

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Secure Computation: Part I

Subject Co-ordinator - Prof. Ashish Choudhury

Co-ordinating Institute - IIITB

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - What is Secure MPC
- Lecture 2 - Real-World Examples of Secure MPC
- Lecture 3 - Various Dimensions to Study Secure MPC
- Lecture 4 - Recap of Basic Concepts from Abstract Algebra
- Lecture 5 - Recap of Basic Concepts from Abstract Algebra (Continued...)
- Lecture 6 - Recap of Basic Concepts from Cryptography
- Lecture 7 - Secret sharing
- Lecture 8 - Additive Secret Sharing
- Lecture 9 - Inefficient Threshold Secret Sharing
- Lecture 10 - Polynomials Over Fields
- Lecture 11 - Shamir Secret-Sharing
- Lecture 12 - Linear secret-sharing
- Lecture 13 - Linear Secret Sharing (Continued...)
- Lecture 14 - General Secret Sharing
- Lecture 15 - Perfectly-Secure Message Transmission
- Lecture 16 - A Toy MPC Protocol
- Lecture 17 - A Toy MPC Protocol (Continued...)
- Lecture 18 - A Toy MPC Protocol (Continued...)
- Lecture 19 - The BGW MPC Protocol
- Lecture 20 - The BGW MPC Protocol for Linear Functions
- Lecture 21 - The BGW MPC Protocol for Linear Functions: Security Analysis
- Lecture 22 - The BGW MPC Protocol: The Case of Non-Linear Gates
- Lecture 23 - The Degree-Reduction Problem
- Lecture 24 - The Gennaro-Rabin-Rabin (GRR) Degree-Reduction Method
- Lecture 25 - Analysis of the GRR, Degree-Reduction Method
- Lecture 26 - Shared Circuit-Evaluation via GRR Degree-Reduction Method
- Lecture 27 - Shared Circuit-Evaluation in the Pre-processing Model
- Lecture 28 - Optimality of Corruption Bound for Perfectly-Secure MPC
- Lecture 29 - Perfectly-Secure MPC Tolerating General (Non-Threshold) Adversaries

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Perfectly-Secure MPC Tolerating General (Non-Threshold) Adversaries with  $Q^{(2)}$  Condition
- Lecture 31 - Perfectly-Secure MPC for Small Number of Parties
- Lecture 32 - Perfectly-Secure 3PC (Continued...)
- Lecture 33 - More Efficient Perfectly-Secure 3PC
- Lecture 34 - More Efficient Perfectly-Secure 3PC (Continued...)
- Lecture 35 - Towards Cryptographically-Secure MPC
- Lecture 36 - GMW MPC protocol
- Lecture 37 - Oblivious Transfer (OT)
- Lecture 38 - RSA Assumption and RSA Hard-Core Predicate
- Lecture 39 - Bit OT Based on RSA Assumption and Hard-Core Predicate
- Lecture 40 - Discrete Logarithm and DDH Assumption
- Lecture 41 - OT Based on the DDH Assumption
- Lecture 42 - Pre-Processing Phase for the GMW Protocol
- Lecture 43 - Pre-Processing Phase for the GMW Protocol: The n-Party Case
- Lecture 44 - Pre-Processing Phase for the GMW Protocol (Continued...)
- Lecture 45 - Pre-Processing of OT
- Lecture 46 - OT Extension
- Lecture 47 - Analysis of IKNP OT Extension
- Lecture 48 - Yao's Protocol for Secure 2PC
- Lecture 49 - Yao's Garbling Scheme
- Lecture 50 - Yao's Protocol for Secure 2PC
- Lecture 51 - Optimizations for Yao's Garbling
- Lecture 52 - Interpreting Yao's Secure 2PC Protocol as a Secret-Sharing Based Protocol
- Lecture 53 - Mixed Protocols for Secure 2PC
- Lecture 54 - The Arithmetic, Boolean and Yao Sharing for Secure 2PC
- Lecture 55 - The ABY Conversions
- Lecture 56 - The ABY Conversions (Continued...)
- Lecture 57 - The ABY Conversions (Continued...)
- Lecture 58 - ABY Computations : Example
- Lecture 59 - Goodbye and Farewell

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Secure Computation - Part II

Subject Co-ordinator - Prof. Ashish Choudhury

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - What is Secure Multi-Party Computation (MPC)?
- Lecture 2 - Reliable Broadcast and Byzantine Agreement
- Lecture 3 - EIG Protocol for Perfectly-Secure Byzantine Agreement
- Lecture 4 - EIG Protocol for Perfectly-Secure Byzantine Agreement: Illustration
- Lecture 5 - EIG Protocol for Perfectly-Secure Byzantine Agreement: Analysis - Part I
- Lecture 6 - EIG Protocol for Perfectly-Secure Byzantine Agreement: Analysis - Part II
- Lecture 7 - Efficient Protocols for Perfectly-Secure Byzantine Agreement - Part I
- Lecture 8 - Efficient Protocols for Perfectly-Secure Byzantine Agreement - Part II
- Lecture 9 - Domain Extension for Perfectly-Secure Byzantine Agreement
- Lecture 10 - Cryptographically/Statistically-Secure Reliable Broadcast
- Lecture 11 - Dolev-Strong Reliable Broadcast Protocol: Analysis
- Lecture 12 - Randomized Protocol for Byzantine Agreement - Part I
- Lecture 13 - Randomized Protocol for Byzantine Agreement - Part II
- Lecture 14 - Randomized Protocol for Byzantine Agreement - Part III
- Lecture 15 - Lower Bound for Number of Parties for Byzantine Agreement - Part I
- Lecture 16 - Lower Bound for Number of Parties for Byzantine Agreement - Part II
- Lecture 17 - Lower Bound for Number of Parties for Byzantine Agreement - Part III
- Lecture 18 - Recap of Basic Concepts from Abstract Algebra
- Lecture 19 - Reed-Solomon Error-Correcting Codes
- Lecture 20 - Perfectly-Secure Message Transmission
- Lecture 21 - Properties of Polynomials Over a Field - I
- Lecture 22 - Properties of Polynomials Over a Field - II
- Lecture 23 - One Round PSMT Protocol
- Lecture 24 - Multi-Round PSMT Protocol - I
- Lecture 25 - Multi-Round PSMT Protocol - II
- Lecture 26 - Domain Extension for Perfectly-Secure Broadcast Based on RS Error-Correcting Codes - I
- Lecture 27 - Domain Extension for Perfectly-Secure Broadcast Based on RS Error-Correcting Codes - II
- Lecture 28 - Domain Extension for Perfectly-Secure Broadcast Based on RS Error-Correcting Codes - III
- Lecture 29 -  $(n, t)$  - Star Structure

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- Lecture 30 - Domain Extension for Perfectly-Secure Broadcast Based on RS Error-Correcting Codes - IV
- Lecture 31 - The BGW MPC Protocol for Passive Corruptions: Recap
- Lecture 32 - The BGW MPC Protocol for Byzantine Corruptions: Challenges
- Lecture 33 - Perfectly-Secure VSS: Necessary Condition
- Lecture 34 - Bivariate Polynomials Over Finite Fields - I
- Lecture 35 - Bivariate Polynomials Over Finite Fields - II
- Lecture 36 - Bivariate Polynomials Over Finite Fields - III
- Lecture 37 - Bivariate Polynomials Over Finite Fields - IV
- Lecture 38 - Perfectly-Secure VSS with  $n$  greater than  $3t$  - Part I
- Lecture 39 - Perfectly-Secure VSS with  $n$  greater than  $3t$  - Part II
- Lecture 40 - Perfectly-Secure VSS with  $n$  greater than  $3t$  - Part III
- Lecture 41 - Perfectly-Secure VSS with  $n$  greater than  $3t$  - A Round-Reducing Technique
- Lecture 42 - Perfectly-Secure VSS with  $n$  greater than  $4t$  - Part I
- Lecture 43 - Perfectly-Secure VSS with  $n$  greater than  $4t$  - Part II
- Lecture 44 - The BGW MPC Protocol for Linear Functions
- Lecture 45 - The BGW MPC Protocol for Linear Functions: Security Analysis
- Lecture 46 - The BGW MPC Protocol: The Case of Non-Linear Gates
- Lecture 47 - The Degree-Reduction Problem
- Lecture 48 - Generating Random Multiplication-Triples - I
- Lecture 49 - Generating Random Multiplication-Triples - II
- Lecture 50 - Generating Random Multiplication-Triples - III
- Lecture 51 - Perfectly-Secure Protocol for Verifying Multiplicative Relationship
- Lecture 52 - Perfectly-Secure Verifiable Triple-Sharing Protocol
- Lecture 53 - Perfectly-Secure Triple-Extraction Protocol
- Lecture 54 - Towards Secure MPC with an Honest Majority
- Lecture 55 - ICP from Information-Theoretic MAC - I
- Lecture 56 - ICP from Information-Theoretic MAC - II
- Lecture 57 - Ingredients for Statistically-Secure MPC
- Lecture 58 - Statistically-Secure VSS
- Lecture 59 - Cyclic Groups and Discrete Logarithm
- Lecture 60 - Pedersen Commitment Scheme
- Lecture 61 - Cryptographically-secure VSS and MPC
- Lecture 62 - Goodbye and Farewell

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Introduction to Graph Algorithms

Subject Co-ordinator - Prof. C. Pandu Rangan

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction and Principles of Algorithms - Part 1  
Lecture 2 - Principles of Algorithms - Part 2  
Lecture 3 - Shortest Path Algorithms  
Lecture 4 - Undirected Graph  
Lecture 5 - Algorithms for finding Shortest Path - Part 1  
Lecture 6 - Algorithms for finding Shortest Path - Part 2  
Lecture 7 - Single source shortest path problem  
Lecture 8 - Properties of shortest path distances - Part 1  
Lecture 9 - Properties of shortest path distances - Part 2  
Lecture 10 - Belman Equation - Part 1  
Lecture 11 - Belman Equation - Part 2  
Lecture 12 - Belman Equation - Part 3  
Lecture 13 - Belman Equation - Part 4  
Lecture 14 - Bellman Ford - Part 1  
Lecture 15 - Bellman Ford - Part 2  
Lecture 16 - Dijkstra Algorithm - Part 1  
Lecture 17 - Dijkstra Algorithm - Part 2  
Lecture 18 - Dijkstra Algorithm - Part 3  
Lecture 19 - All Pair Shortest - Path 1  
Lecture 20 - All Pair Shortest - Path 2  
Lecture 21 - All Pair Shortest - Path 3 and 4  
Lecture 22 - All Pair Shortest - Path 5  
Lecture 23 - Prims Algorithm - Part 1  
Lecture 24 - Prims Algorithm - Part 2  
Lecture 25 - Kruskal's Algorithm - Part 1  
Lecture 26 - Kruskal's Algorithm - Part 2  
Lecture 27 - Kruskal's Algorithm - Part 3  
Lecture 28 - DFS  
Lecture 29 - DFS

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - Algorithm for Cut Vertex
- Lecture 31 - Iterative DFS
- Lecture 32 - DFS in Directed Graph
- Lecture 33 - Strong Connected Components - Part 1
- Lecture 34 - Strong Connected Components - Part 2
- Lecture 35 - Strong Connected Components - Part 3
- Lecture 36 - Strong Connected Components - Part 4
- Lecture 37 - BFS

## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Computer Science and Engineering - NOC:Linear Algebra Through Geometry

Subject Co-ordinator - Prof. Ashok Rao, Prof. M Krishna Kumar, Prof. Arulalan M R

Co-ordinating Institute - IISc - Bangalore

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction to Linear Algebra and Matrices
- Lecture 2 - Geometry of System of linear equations - Straight lines and planes, Matrix Definitions
- Lecture 3 - Some Interpretations to solutions of system of linear equations
- Lecture 4 - Matrix Operations, Homogeneous system of equations
- Lecture 5 - Matrix Operations, Homogeneous system of equations
- Lecture 6 - Elementary Row Operations
- Lecture 7 - Elementary Row operations - How do they work?
- Lecture 8 - Determinant and Inverse of a matrix
- Lecture 9 - Interpreting the inverse of a matrix
- Lecture 10 - Cramer's rule
- Lecture 11 - Points and Vectors in 2D
- Lecture 12 - Vector Length and properties
- Lecture 13 - Combining Vectors
- Lecture 14 - Linearly Independent and Dependent vectors, Dot Product of vectors
- Lecture 15 - Angle between two vectors, Orthogonal projections
- Lecture 16 - Lines and Parametric Equations of lines, Linear Maps
- Lecture 17 - Rotation, Shear and Projection transformations
- Lecture 18 - Determinant of 2x2 matrix as Area of Parallelogram, Determinant of linear transformations
- Lecture 19 - System of 2 linear equations in 2 unknowns from vector perspective
- Lecture 20 - Eigenvalues and eigenvectors
- Lecture 21 - Vectors in 3D, Linear combination of vectors in 3D
- Lecture 22 - Projection vector on another vector, line passing through origin, plane passing through origin
- Lecture 23 - Area of a parallelogram in 3D, Cross product
- Lecture 24 - Interpreting the cross-product, Properties of cross-product
- Lecture 25 - Volume of a parallelepiped, Lines in 3D, Intersection of line and plane
- Lecture 26 - Linear Maps in 3D - Scaling and Reflection
- Lecture 27 - Linear Maps in 3D - Reflection about a plane, Shear
- Lecture 28 - Rotation in 3D
- Lecture 29 - Determinant and its properties

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## NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

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- Lecture 30 - eigenvalues and eigenvectors in 3D
- Lecture 31 - Linear systems in 3D and geometric perspective
- Lecture 32 - Homogeneous system in 3D
- Lecture 33 - LU Decomposition
- Lecture 34 - Least Squares Solution, Gram-Schmidt Orthogonalization, QRDecomposition
- Lecture 35 - Orthogonal Matrix, Linear Independence, eigenvalues and eigenvectors in 3D
- Lecture 36 - Vector Space and Properties
- Lecture 37 - Examples of vector spaces - Polynomial space, planes and lines through origin
- Lecture 38 - Vector Subspaces and their geometry
- Lecture 39 - Combining vectors in a vector space, Linear Independence
- Lecture 40 - Span, Basis, Dimension of a vector space, Fourier Expansion
- Lecture 41 - Homogeneous system of linear equations and null space of a matrix
- Lecture 42 - Column Space of A
- Lecture 43 - Subspaces associated matrix A transpose, Nullity, Rank
- Lecture 44 - Orthogonal Complement of a subspace
- Lecture 45 - Orientation of the four fundamental subspaces of a matrix A
- Lecture 46 - System of linear equations with no solution - Inconsistent systems
- Lecture 47 - Least squares solution, Pseudoinverse of A
- Lecture 48 - Projection and Projection Matrices
- Lecture 49 - Pseudoinverse of special matrices
- Lecture 50 - Eigendecomposition
- Lecture 51 - Eigensubspace and dimension
- Lecture 52 - Real Symmetric matrix and properties
- Lecture 53 - Eigenvalues and eigenvectors of real symmetric matrices
- Lecture 54 - Effect of a real symmetric matrix - Geometric Interpretation
- Lecture 55 - Spectral Theorem, Quadratic Forms
- Lecture 56 - Singular Value Decomposition
- Lecture 57 - Relationship between SVD and Eigen Decomposition
- Lecture 58 - An Interpretation of SVD
- Lecture 59 - Fourier Series and Transform through Linear Algebra
- Lecture 60 - Practical Applications of Linear Algebra - 1
- Lecture 61 - Practical Applications of Linear Algebra - 2
- Lecture 62 - Summary and Credits