NPTEL : Natural Language Processing (Computer Science and Engineering)

Co-ordinators : Prof. Pushpak Bhattacharya

NPTEL : Design and Analysis of Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. Sundar Viswanathan, Prof. Ajit A Diwan, Prof. Abhiram G Ranade

NPTEL : Software Engineering (Computer Science and Engineering)

Co-ordinators : Prof. N.L. Sarda, Prof. Umesh Bellur, Prof. Rushikesh K Joshi

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

Co-ordinators : Prof. Meenakshi D'souza

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: As used in testing

Lecture 6 - Structural Graph Coverage Criteria

Lecture 7 - Elementary Graph Algorithms - Part 1

Lecture 8 - Elementary Graph Algorithms - Part 2

Lecture 9 - Algorithms: Structural Graph Coverage Criteria

Lecture 10 - Assignment 2: Structural Coverage Criteria

Lecture 11 - Data Flow Graphs

Lecture 12 - Algorithms: Data Flow Graph Coverage Criteria

Lecture 13 - Graph Coverage Criteria: Applied to Test Code

Lecture 14 - Testing Source Code: Classical Coverage Criteria

Lecture 15 - Data Flow Graph Coverage Criteria : Applied to Test Code

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: Graph Coverage Criteria

Lecture 21 - Logic: Basics Needed for Software Testing

Lecture 22 - Logic: Coverage Criteria

Lecture 23 - Coverage Criteria, (Continued...)

Lecture 24 - Logic Coverage Criteria

Lecture 25 - Logic Coverage Criteria: Applied to Test Code_1

Lecture 26 - Logic Coverage Criteria: Applied to Test Code_2

Lecture 27 - Logic Coverage Criteria: Issues in Applying to Test Code

Lecture 28 - Logic Coverage Criteria: Applied to Test Specifications

Lecture 29 - Logic Coverage Criteria: Applied to Finite State Machines

Lecture 30 - Week 6 Assignment Solving

Lecture 31 - Functional Testing

NPTEL : NOC:Design and Pedagogy of the Introductory Programming Course (Computer Science and Engineering)

Co-ordinators : Prof. Abhiram G Ranade

NPTEL : NOC:An Introduction to Programming through C++ (Computer Science and Engineering)

Co-ordinators : Prof. Abhiram G Ranade

Lecture 99 - The Standard Library - Part 1 : Class string

Lecture 100 - The Standard Library - Part 2 : Class vector

Lecture 101 - The Standard Library - Part 3 : Sorting vectors and arrays

Lecture 102 - The Standard Library - Part 4 : Classes map and unordered_map

Lecture 103 - The Standard Library - Part 5 : Iterators

Lecture 104 - Data structure based programming - Part 1 : Introduction

Lecture 105 - Data structure based programming - Part 2 : Set and pair classes

Lecture 106 - Data structure based programming - Part 3 : Implementation of standard library data structures

Lecture 107 - Data structure based programming - Part 4 : Composing data structures

Lecture 108 - Data structure based programming - Part 5 : typedef and lecture conclusion

Lecture 109 - Medium size programs - Part 1 : The new marks display program

Lecture 110 - Medium size programs - Part 2 : Manual algorithm for new marks display

Lecture 111 - Medium size programs - Part 3 : RSMTAB and rest of the program

Lecture 112 - Medium size programs - Part 4 : Sophisticated solutions to marks display

Lecture 113 - A graphical editor and solver for circuits - Part 1 : Outline

Lecture 114 - A graphical editor and solver for circuits - Part 2 : Main program and organization

Lecture 115 - A graphical editor and solver for circuits - Part 3 : Mathematical representation of the circuit

Lecture 116 - A graphical editor and solver for circuits - Part 4 : Extensions and concluding remarks

Lecture 117 - Cosmological simulation - Part 1 : Introduction and First order Euler method

Lecture 118 - Cosmological simulation - Part 2 : Second order Euler method

Lecture 119 - Cosmological simulation - Part 3 : The program

Lecture 120 - Cosmological simulation - Part 4 : Concluding remarks

NPTEL : NOC:Demystifying Networking (Computer Science and Engineering)

Co-ordinators : Prof.Sridhar Iyer

NPTEL : NOC:Learning Analytics Tools (Computer Science and Engineering)

Co-ordinators : Prof. Ramkumar Rajendran

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

Lecture 30 - Data Mining

Lecture 31 - iSAT

NPTEL : NOC:Design and Engineering of Computer Systems (Computer Science and Engineering)

Co-ordinators : Prof. Mythili Vutukuru

NPTEL : NOC:Software Conceptual Design (Computer Science and Engineering)

Co-ordinators : Prof. Sridhar Iyer, Prof. Prajish Prasad, Prof. T. G. Lakshmi

NPTEL : NOC:Introduction to Game Theory and Mechanism Design (Computer Science and Engineering)

Co-ordinators : Prof. Swaprava Nath

NPTEL : NOC:Introduction to Computer and Network Performance Analysis using Queuing Systems (Computer Science and Engineering)

Co-ordinators : Prof. Varsha Apte

NPTEL : NOC:Games and Information (Computer Science and Engineering)

Co-ordinators : Prof. Ankur A. Kulkarni

NPTEL : NOC:Distributed Optimization and Machine Learning (Computer Science and Engineering)

Co-ordinators : Prof. Mayank Baranwal

NPTEL : Computational Geometry (Computer Science and Engineering)

Co-ordinators : Prof. Sandeep Sen

NPTEL : Logic for CS (Computer Science and Engineering)

Co-ordinators : Prof. S. Arun Kumar

NPTEL : Computer Architecture (Prof. Anshul Kumar) (Computer Science and Engineering)

Co-ordinators : Prof. Anshul Kumar

NPTEL : Data Structures And Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. Naveen Garg

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: Searching for Patterns

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

Lecture 30 - Applications of DFS in Directed Graphs

Lecture 31 - Minimum Spanning Trees

NPTEL : Introduction to Computer Graphics (Computer Science and Engineering)

Co-ordinators : Prof. Prem K Kalra

NPTEL : Principles of Programming Languages (Computer Science and Engineering)

Co-ordinators : Prof. S. Arun Kumar

NPTEL : Parallel Computing (Computer Science and Engineering)

Co-ordinators : Dr. Subodh Kumar

NPTEL : Operating Systems (Computer Science and Engineering)

Co-ordinators : Prof. Sorav Bansal

NPTEL : NOC:Computer Architecture (2017) (Computer Science and Engineering)

Co-ordinators : Prof. Smruti R.Sarangi

NPTEL : NOC:Introduction to Parallel Programming in OpenMP (Computer Science and Engineering)

Co-ordinators : Dr. Yogish Sabharwal

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 - Characteriziation 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

NPTEL : NOC:Synthesis of Digital Systems (Computer Science and Engineering)

Co-ordinators : Prof. Preeti Ranjan Panda

NPTEL : NOC:An Introduction to Artificial Intelligence (Computer Science and Engineering)

Co-ordinators : Prof. Mausam

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

Co-ordinators : Prof. Smruti R. Sarangi

NPTEL : NOC:Advanced Distributed systems (Computer Science and Engineering)

Co-ordinators : Prof. Smruti R. Sarangi

NPTEL : Design Verification and Test of Digital VLSI Circuits (Computer Science and Engineering)

Co-ordinators : Dr. Santosh Biswas, Prof. Jatindra Kumar Deka

NPTEL : NOC:Computer Organization and Architecture - A Pedagogical Aspect (Computer Science and Engineering)

Co-ordinators : Prof.Arnab sarkar, Prof.Jatindra Kumar Deka, Dr. Santosh Biswas

NPTEL : NOC:Embedded Systems-Design Verification and Test (Computer Science and Engineering)

Co-ordinators : Prof.Jatindra Kumar Deka, Dr. Santosh Biswas, Prof.Arnab Sarkar

NPTEL : NOC:Multi-Core Computer Architecture-Storage and Interconnects (Computer Science and Engineering)

Co-ordinators : Prof. John Jose

NPTEL : NOC:Multi-Core Computer Architecture (Computer Science and Engineering)

Co-ordinators : Prof. John Jose

NPTEL : NOC:Randomized Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. Benny George K

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

Lecture 30 - DNF counting

Lecture 31 - Perfect Matching - I

NPTEL : NOC:Parallel Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. Sajith Gopalan

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

Co-ordinators : Prof. Benny George K

NPTEL : NOC:Advanced Computer Architecture (Computer Science and Engineering)

Co-ordinators : Prof. John Jose

NPTEL : NOC:User-centric Computing for Human-Computer Interaction (Computer Science and Engineering)

Co-ordinators : Prof. Samit Bhattacharya

NPTEL : NOC:Computer Graphics (Computer Science and Engineering)

Co-ordinators : Prof. Samit Bhattacharya

Lecture 32 - Concluding remarks

NPTEL : NOC:C-Based VLSI Design (Computer Science and Engineering)

Co-ordinators : Prof. Chandan Karfa

NPTEL : NOC:Design and Implementation of Human-Computer Interfaces (Computer Science and Engineering)

Co-ordinators : Prof. Samit Bhattacharya

NPTEL : NOC:Digital Design with Verilog (Computer Science and Engineering)

Co-ordinators : Prof. Chandan Karfa, Prof. Aryabartta Sahu

NPTEL : NOC:Parallel Computer Architecture (Computer Science and Engineering)

Co-ordinators : Prof. Hemangee K. Kapoor

Lecture 65 - Flow Control

NPTEL : Computer Algorithms - 2 (Computer Science and Engineering)

Co-ordinators : Prof. Shashank K. Mehta

NPTEL : Theory of Computation (Computer Science and Engineering)

Co-ordinators : Prof. Somenath Biswas

NPTEL : Introduction to Problem Solving and Programming (Computer Science and Engineering)

Co-ordinators : Prof. D. Gupta

NPTEL : Riemann Hypothesis and its Applications (Computer Science and Engineering)

Co-ordinators : Prof. Manindra Agrawal

NPTEL : Biometrics (Computer Science and Engineering)

Co-ordinators : Prof. Phalguni Gupta

NPTEL : Parallel Algorithm (Computer Science and Engineering)

Co-ordinators : Prof. Phalguni Gupta

NPTEL : Computer Architecture (Dr. Mainak Chaudhuri) (Computer Science and Engineering)

Co-ordinators : Dr. Mainak Chaudhuri

NPTEL : Compiler Design (Prof. Sanjeev K Aggarwal) (Computer Science and Engineering)

Co-ordinators : Prof. Sanjeev K Aggarwal

NPTEL : NOC : Introduction to programming in C (Computer Science and Engineering)

Co-ordinators : Prof. Satyadev Nandakumar

NPTEL : NOC:Fundamentals of Database Systems (Computer Science and Engineering)

Co-ordinators : Dr. Arnab Bhattacharya

NPTEL : NOC:Theory of Computation (Computer Science and Engineering)

Co-ordinators : Prof. Raghunath Tewari

NPTEL : NOC:Modern Algebra (Computer Science and Engineering)

Co-ordinators : Prof. Manindra Agrawal

NPTEL : NOC:Advanced Graph Theory (Computer Science and Engineering)

Co-ordinators : Dr.Rajiv Misra

NPTEL : NOC:Cloud Computing and Distributed Systems (Computer Science and Engineering)

Co-ordinators : Dr.Rajiv Misra

NPTEL : NOC:Big Data Computing (Computer Science and Engineering)

Co-ordinators : Dr. Rajiv Misra

NPTEL : NOC:Introduction to Blockchain Technology and Applications (Computer Science and Engineering)

Co-ordinators : Prof. Sandeep Shukla

NPTEL : NOC:Arithmetic Circuit Complexity (Computer Science and Engineering)

Co-ordinators : Prof. Nitin Saxena

NPTEL : NOC:Computational Complexity Theory (Computer Science and Engineering)

Co-ordinators : Prof. Raghunath Tewari

NPTEL : NOC:Randomized Methods in Complexity (Computer Science and Engineering)

Co-ordinators : Prof. Nitin Saxena

NPTEL : NOC:Probability for Computer Science (Computer Science and Engineering)

Co-ordinators : Prof. Nitin Saxena

Lecture 32 - Streaming Algorithms - II

NPTEL : NOC:Circuit Complexity Theory (Computer Science and Engineering)

Co-ordinators : Prof. Raghunath Tewari

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-Hertramph Theorem) - I

Lecture 54 - Uniform AC0 can be simulated by depth 3 Threshold circuits of quasipolynomial size (Allender-Hertramph Theorem) - II

Lecture 55 - Valient-Vazirani Theorem - I

Lecture 56 - Valient-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 : NOC:Foundation of Cloud IoT Edge ML (Computer Science and Engineering)

Co-ordinators : Prof. Rajiv Misra

NPTEL : NOC:Linear Programming and its Applications to Computer Science (Computer Science and Engineering)

Co-ordinators : Prof. Rajat Mittal

NPTEL : NOC:Basics of Computational Complexity (Computer Science and Engineering)

Co-ordinators : Prof. Nitin Saxena

NPTEL : NOC:Edge Computing (Computer Science and Engineering)

Co-ordinators : Multi-Faculty

NPTEL : NOC:Practical Cyber Security for Cyber Security Practitioners (Computer Science and Engineering)

Co-ordinators : Prof. Sandeep K. Shukla

NPTEL : NOC:Computational Arithmetic - Geometry for Algebraic Curves (Computer Science and Engineering)

Co-ordinators : Prof. Nitin Saxena

NPTEL : Cryptography and Network Security (Computer Science and Engineering)

Co-ordinators : Dr. Debdeep Mukhopadhyay

NPTEL : High Performance Computer Architecture (Computer Science and Engineering)

Co-ordinators : Prof. Ajit Pal

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

Lecture 30 - Virtual Memory (Continued...)

Lecture 31 - Virtual Machines

NPTEL : Low Power VLSI Circuits and Systems (Computer Science and Engineering)

Co-ordinators : Prof. Ajit Pal

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 : Real Time Systems (Computer Science and Engineering)

Co-ordinators : Prof. Rajib Mall

NPTEL : Artificial Intelligence (Prof. Anupam Basu) (Computer Science and Engineering)

Co-ordinators : Prof. Sudeshna Sarkar, Prof. Anupam Basu

NPTEL : Artificial Intelligence (Prof. P. Dasgupta) (Computer Science and Engineering)

Co-ordinators : Prof. P. Dasgupta

NPTEL : Computer Networks (Computer Science and Engineering)

Co-ordinators : Prof. Sujoy Ghosh

NPTEL : Data Communication (Computer Science and Engineering)

Co-ordinators : Prof. Ajit Pal

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

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 : Electronic Design Automation (Computer Science and Engineering)

Co-ordinators : Prof. Indranil Sengupta

NPTEL : Internet Technology (Computer Science and Engineering)

Co-ordinators : Prof. Indranil Sengupta

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 : Part-I

Lecture 39 - Search Engine And Web Crawlers : Part-II

Lecture 40 - Course Summary And Conclusion

NPTEL : Programming and Data Structure (Computer Science and Engineering)

Co-ordinators : Dr. P.P. Chakraborty

Lecture 32 - Conclusions

NPTEL : NOC:Software Testing (Computer Science and Engineering)

Co-ordinators : Prof. Rajib Mall

NPTEL : NOC:Programming in C++ (Computer Science and Engineering)

Co-ordinators : Prof. Partha Pratim Das

NPTEL : NOC:Introduction to Machine Learning (Computer Science and Engineering)

Co-ordinators : Prof. S. Sarkar

NPTEL : NOC:Object-Oriented Analysis and Design (Computer Science and Engineering)

Co-ordinators : Prof. Partha Pratim Das

NPTEL : NOC:Complex Network : Theory and Application (Computer Science and Engineering)

Co-ordinators : Prof. Animesh Mukherjee

NPTEL : Fundamental Algorithms:Design and Analysis (Computer Science and Engineering)

Co-ordinators : Prof.Sourav Mukhopadhyay

NPTEL : NOC:Natural Language Processing (Computer Science and Engineering)

Co-ordinators : Prof. Pawan Goyal

Lecture 65 - Aspect - Based Sentiment Analysis

NPTEL : NOC:Embedded Systems Design (Computer Science and Engineering)

Co-ordinators : Prof. Anupam Basu

NPTEL : NOC:Wireless Ad Hoc and Sensor Networks (Computer Science and Engineering)

Co-ordinators : Prof. Sudip Misra

NPTEL : NOC:VLSI Physical Design (Computer Science and Engineering)

Co-ordinators : Prof. Indranil Sengupta

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 : NOC:Cryptography And Network Security (Computer Science and Engineering)

Co-ordinators : Prof. Sourav Mukhopadhyay

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

Lecture 30 - Elliptic curve Modulo a Prime

Lecture 31 - Generalised ElGamal Public Key Cryptosystem

NPTEL : NOC:Computer Architecture and Organization (Computer Science and Engineering)

Co-ordinators : Prof. Indranil Sengupta, Prof. Kamalika Datta

NPTEL : NOC:Introduction to Algorithms and Analysis (Computer Science and Engineering)

Co-ordinators : Prof. Sourav Mukhopadhyay

NPTEL : NOC:Hardware Modeling using Verilog (Computer Science and Engineering)

Co-ordinators : Prof. Indranil Sengupta

NPTEL : NOC:Introduction to Internet of Things (Computer Science and Engineering)

Co-ordinators : Prof. Sudip Misra

Lecture 32 - Implementation of IoT with Raspberry Pi - III

Lecture 33 - Software Defined Networking - Part I

Lecture 34 - Software Defined Networking - Part II

Lecture 35 - Software Defined IoT Networking - I

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: Agriculture

Lecture 58 - Case Study: Healthcare

Lecture 59 - Case Study: Activity Monitoring - I

Lecture 60 - Case Study: Activity Monitoring - II

NPTEL : NOC:Cloud Computing (Computer Science and Engineering)

Co-ordinators : Prof. Soumya Kanti Ghosh

NPTEL : NOC:Problem Solving through Programming in C (Computer Science and Engineering)

Co-ordinators : Prof.Arnab sarkar, Prof.Jatindra Kumar Deka, Dr. Santosh Biswas

NPTEL : NOC:Real Time Operating System (Computer Science and Engineering)

Co-ordinators : Prof. Rajib Mall

NPTEL : NOC:Introduction to Soft Computing (Computer Science and Engineering)

Co-ordinators : Prof. Debasis Samanta

NPTEL : NOC:Data Mining (Computer Science and Engineering)

Co-ordinators : Prof. Pabitra Mitra

NPTEL : NOC:Data Base Management System (Computer Science and Engineering)

Co-ordinators : Prof. Partha Pratim Das

NPTEL : NOC:Software Engineering (Computer Science and Engineering)

Co-ordinators : Prof. Rajib Mall

NPTEL : NOC:Computer Networks and Internet Protocol (Computer Science and Engineering)

Co-ordinators : Prof. Sandip Chakraborty, Prof. Soumya Kanti Ghosh

NPTEL : NOC:Blockchain Architecture Design and Use Cases (Computer Science and Engineering)

Co-ordinators : Praveen Jayachandran, Prof. Sandip Chakraborty

NPTEL : NOC:Switching Circuits and Logic Design (Computer Science and Engineering)

Co-ordinators : Prof. Indranil Sengupta

NPTEL : NOC:Scalable Data Science (Computer Science and Engineering)

Co-ordinators : Prof. Sourangshu Bhattacharya, Prof. Anirban Dasgupta

NPTEL : NOC:Compiler Design (Computer Science and Engineering)

Co-ordinators : Prof. Santanu Chattopadhyay

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: PIPO and SISO

Lecture 38 - Shift Register: SIPO, PISO and Universal 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 : NOC:Programming in Java (Computer Science and Engineering)

Co-ordinators : Prof. Debasis Samanta

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 : NOC:Discrete Structures (Computer Science and Engineering)

Co-ordinators : Prof. Dipanwita Roychowdhury

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 : NOC:Embedded System Design with ARM (Computer Science and Engineering)

Co-ordinators : Prof. Indranil Sengupta, Prof. Kamalika Datta

NPTEL : NOC:Hardware Security (Computer Science and Engineering)

Co-ordinators : Dr. Debdeep Mukhopadhyay

NPTEL : NOC:Introduction to Industry 4.0 and Industrial Internet of Things (Computer Science and Engineering)

Co-ordinators : Prof. Sudip Misra

Lecture 32 - Key Enablers of Industrial IoT: Connectivity - Part 5

Lecture 33 - Key Enablers of Industrial IoT: Processing - Part 1

Lecture 34 - Key Enablers of Industrial IoT: Processing - Part 2

Lecture 35 - Key Enablers of Industrial IoT: Process Control

Lecture 36 - IIoT Analytics and Data Management: Introduction

Lecture 37 - IIoT Analytics and Data Management: Machine Learning and Data Science - Part 1

Lecture 38 - IIoT Analytics and Data Management: Machine Learning and Data Science - Part 2

Lecture 39 - IIoT Analytics and Data Management: Cloud Computing in IIoT - Part 1

Lecture 40 - IIoT Analytics and Data Management: Cloud Computing in IIoT - Part 2

Lecture 41 - Analytics and Data Management: Fog Computing in IIoT

Lecture 42 - IIoT Analytics and Data Management: Tutorial for R and Julia Programming

Lecture 43 - IIoT Analytics and Data Management: Data Management with Hadoop

Lecture 44 - IIoT Analytics and Data Management: Data Center Networks

Lecture 45 - Advanced Technologies: Software-Defined Networking (SDN) in IIoT - Part 1

Lecture 46 - Advanced Technologies: Software-Defined Networking (SDN) in IIoT - Part 2

Lecture 47 - Advanced Technologies: Security in IIoT - Part 1

Lecture 48 - Advanced Technologies: Security in IIoT - Part 2

Lecture 49 - IIoT Applications: Factories and Assembly Line

Lecture 50 - IIoT Applications: Food Industry

Lecture 51 - IIoT Applications: Inventory Management and Quality Control

Lecture 52 - IIoT Applications: Plant Security and Safety

Lecture 53 - IIoT Applications: Facility Management

Lecture 54 - IIoT Applications: Oil, Chemical and Pharmaceutical Industry

Lecture 55 - IIoT Applications: UAVs in Industries

Lecture 56 - IIoT Applications: Oil, Chemical and Pharmaceutical Industry

Lecture 57 - IIoT Applications: UAVs in Industries

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 : NOC:Introduction to Automata, Languages and Computation (Computer Science and Engineering)

Co-ordinators : Prof. Sourav Mukhopadhyay

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 : NOC:Operating System Fundamentals (Computer Science and Engineering)

Co-ordinators : Prof. Santanu Chattopadhyay

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

Co-ordinators : Prof. P.K. Biswas

NPTEL : NOC:Computer Vision (Computer Science and Engineering)

Co-ordinators : Prof. Jayanta Mukhopadhyay

NPTEL : NOC:Ethical Hacking (Computer Science and Engineering)

Co-ordinators : Prof. Indranil Sengupta

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

Lecture 30 - Public-key cryptography - Part II

Lecture 31 - Cryptographic hash functions - Part I

NPTEL : NOC:Software Project Management (Computer Science and Engineering)

Co-ordinators : Prof. Durga Prasad Mohapatra

NPTEL : NOC:Spatial Informatics (Computer Science and Engineering)

Co-ordinators : Prof. Soumya Kanti Ghosh

NPTEL : NOC:GPU Architectures and Programming (Computer Science and Engineering)

Co-ordinators : Prof. Soumyajit Dey

NPTEL : NOC:Google Cloud Computing Foundation Course (Computer Science and Engineering)

Co-ordinators : Prof. Soumya Kanti Ghosh

NPTEL : NOC:Object Oriented System Development using UML, Java and Patterns (Computer Science and Engineering)

Co-ordinators : Prof. Rajib Mall

NPTEL : NOC:Data Structure and Algorithms using Java (Computer Science and Engineering)

Co-ordinators : Prof. Debasis Samanta

NPTEL : NOC:Real-Time Systems (Computer Science and Engineering)

Co-ordinators : Prof. Rajib Mall

NPTEL : NOC:Algorithms for Protein Modelling and Engineering (Computer Science and Engineering)

Co-ordinators : Prof. Pralay Mitra

NPTEL : NOC:Programming in Modern C++ (Computer Science and Engineering)

Co-ordinators : Prof. Partha Pratim Das

NPTEL : NOC:Blockchain and its Applications (Computer Science and Engineering)

Co-ordinators : Prof. Sandip Chakraborty, Prof. Shamik Sural

NPTEL : NOC:Algorithmic Game Theory (Computer Science and Engineering)

Co-ordinators : Prof. Palash Dey

NPTEL : NOC:Machine Learning for Earth System Sciences (Computer Science and Engineering)

Co-ordinators : Prof. Adway Mitra

NPTEL : NOC:Statistical Learning for Reliability Analysis (Computer Science and Engineering)

Co-ordinators : Prof. Monalisa Sarma

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 : NOC:Foundations of Cyber Physical Systems (Computer Science and Engineering)

Co-ordinators : Prof. Soumyajit Dey

NPTEL : NOC:Selected Topics in Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. Palash Dey

NPTEL : NOC:Foundations and Applications of Machine Learning (Bengali) (Computer Science and Engineering)

Co-ordinators : Prof. Adway Mitra

NPTEL : NOC:Artificial Intelligence for Economics (Computer Science and Engineering)

Co-ordinators : Prof. Dripto Bakshi, Prof. Adway Mitra, Prof. Palash Dey

NPTEL : NOC:Approximation Algorithm (Computer Science and Engineering)

Co-ordinators : Prof. Palash Dey

NPTEL : Pattern Recognition (Computer Science and Engineering)

Co-ordinators : Prof. Sukhendu Das, Prof. C.A. Murthy

NPTEL : Performance Evaluation of Computer Systems (Computer Science and Engineering)

Co-ordinators : Prof. Krishna Moorthy Sivalingam

NPTEL : Theory of Automata, Formal Languages and Computation (Computer Science and Engineering)

Co-ordinators : Prof. Kamala Krithivasan

NPTEL : Computer Graphics (Computer Science and Engineering)

Co-ordinators : Prof. Sukhendu Das

NPTEL : Computer Organization (Computer Science and Engineering)

Co-ordinators : Prof. S. Raman

NPTEL : Database Design (Computer Science and Engineering)

Co-ordinators : Dr. S. Srikanth, Prof. D. Janaki Ram

NPTEL : Discrete Mathematical Structures (Computer Science and Engineering)

Co-ordinators : Prof. Kamala Krithivasan

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)

Lecture 30 - Generating Functions

Lecture 31 - Generating Functions (Continued)

NPTEL : Artificial Intelligence (Prof. Deepak Khemani) (Computer Science and Engineering)

Co-ordinators : Prof. Deepak Khemani

NPTEL : NOC:Programming, Data Structures and Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. Hema A Murthy, Prof. Shankar Balachandran, Dr. N.S. Narayanaswamy

NPTEL : NOC:Introduction to Information Security I (Computer Science and Engineering)

Co-ordinators : Prof. V. Kamakoti

Lecture 65 - Module 6 - Part 8

NPTEL : NOC:Programming and Data structures (PDS) (Computer Science and Engineering)

Co-ordinators : Dr. N S. Narayanaswamy

NPTEL : NOC:Design and Analysis of Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. Madhavan Mukund

NPTEL : NOC:Programming, Data Structures and Algorithms (Aricent) (Computer Science and Engineering)

Co-ordinators : Dr. N S. Narayanaswamy, Prof. Shankar Balachandran, Prof. Hema A Murthy

NPTEL : NOC:Computer Architecture (Computer Science and Engineering)

Co-ordinators : Prof.Madhu Mutyam

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

Lecture 30 - Cache Coherence Protocol Design

Lecture 31 - Synchronization

NPTEL : NOC:Model Checking (Computer Science and Engineering)

Co-ordinators : Prof. B. Srivathsan

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

Lecture 30 - Module 3 - Checking emptiness of NBA

Lecture 31 - Module 4 - Generalized NBA

NPTEL : NOC:Functional Programming in Haskell (Computer Science and Engineering)

Co-ordinators : Prof. Madhavan Mukund, Prof. S P Suresh

NPTEL : Virtual Reality ()

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

NPTEL : NOC:Introduction to Machine Learning (Sponsored by Arihant) (Computer Science and Engineering)

Co-ordinators : Dr. Balaraman Ravindran

NPTEL : NOC:Artificial Intelligence: Knowledge Representation and Reasoning (Computer Science and Engineering)

Co-ordinators : Prof. Deepak Khemani

NPTEL : NOC:Information Security - II (Computer Science and Engineering)

Co-ordinators : Prof. V. Kamakoti

NPTEL : NOC:Algorithms for Big Data (Computer Science and Engineering)

Co-ordinators : Prof. John Augustine

NPTEL : NOC:Reinforcement Learning (Computer Science and Engineering)

Co-ordinators : Dr. B. Ravindran

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 : NOC:Introduction to Operating Systems (Computer Science and Engineering)

Co-ordinators : Prof. Chester Rebeiro

NPTEL : NOC:Programming, Data Structures and Algorithms in Python (Computer Science and Engineering)

Co-ordinators : Prof. Madhavan Mukund

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 : NOC:Privacy and Security in Online Social Networks (Computer Science and Engineering)

Co-ordinators : Prof. Ponnurangam Kumaraguru

NPTEL : NOC:Mobile Computing (Computer Science and Engineering)

Co-ordinators : Prof. Pushpendra Singh

NPTEL : NOC:Introduction to Modern Application Development (Computer Science and Engineering)

Co-ordinators : Tanmai Gopal, Prof. Gaurav Raina

NPTEL : NOC:Information Security-3 (Computer Science and Engineering)

Co-ordinators : Prof. V. Kamakoti

NPTEL : NOC:AI:Constraint Satisfaction (Computer Science and Engineering)

Co-ordinators : Prof. Deepak Khemani

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 - GaschnigÂ’s Backjumping: The Culprit Variable

Lecture 30 - GaschnigÂ’s Backjumping, Graph-Based Backjumping

Lecture 31 - Graph-Based Backjumping: Internal and Relevant Dead-Ends

NPTEL : NOC:Computer Organization (Computer Science and Engineering)

Co-ordinators : Prof. V. Kamakoti

NPTEL : NOC:Introduction to Wireless and Cellular Communications (Computer Science and Engineering)

Co-ordinators : Prof. David Kovil Pillai

NPTEL : NOC:Distributed Systems (Computer Science and Engineering)

Co-ordinators : Dr. Rajiv Misra

NPTEL : NOC:Social Networks (Computer Science and Engineering)

Co-ordinators : Prof. Sudarshan Iyengar

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

Lecture 69 - Outline of implemantation

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 Commmunities 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 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

Lecture 147 - Decentralized Search - I

Lecture 148 - Decentralized Search - II

Lecture 149 - Decentralized Search - III

Lecture 150 - Programming illustration- Small world networks : Introduction

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 : Introduction>

Lecture 156 - Myopic Search

Lecture 157 - Myopic Search comparision to optimal search

Lecture 158 - Time Taken by Myopic Search

Lecture 159 - PseudoCores : Introduction

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

NPTEL : NOC:An Introduction to Probability in Computing (Computer Science and Engineering)

Co-ordinators : Prof. John Augustine

NPTEL : NOC:Introduction to Human Computer Interaction (Computer Science and Engineering)

Co-ordinators : Prof. Ponnurangam Kumaraguru

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: Low fidelity and High fidelity

Lecture 14 - User-Centered Design

Lecture 15 - Lab Session: Task Analysis

Lecture 16 - Design Patterns

Lecture 17 - Lab Session: Material Design

Lecture 18 - Usable security

Lecture 19 - Lab Session: Task Analysis - 2

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

NPTEL : NOC:Information Security-IV (Computer Science and Engineering)

Co-ordinators : Prof.M J Shankar Raman, Prof. V. Kamakoti, Prof.Vasan

NPTEL : NOC:Data Science for Engineers (Computer Science and Engineering)

Co-ordinators : Prof. Shankar Narasimhan, Prof. Ragunathan Rengasamy

NPTEL : NOC:The Joy of Computing using Python (Computer Science and Engineering)

Co-ordinators : Prof. Sudarshan Iyengar

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

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 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 : Meet your favourites

Lecture 171 - Six Degrees of Separation : Meet your favourites - Part 01

Lecture 172 - Six Degrees of Separation : Meet your favourites - Part 02

Lecture 173 - Six Degrees of Separation : Meet your favourites - Part 03

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

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

NPTEL : NOC:Discrete Mathematics (Computer Science and Engineering)

Co-ordinators : Prof. Sudarshan Iyengar

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

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 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

Lecture 225 - Mathematical Induction - Example 9

Lecture 226 - Mathematical Induction - Example 10 solution

Lecture 227 - Binomial Coeffecients - Proof by induction

Lecture 228 - Checker board and Triomioes - 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 Pegionhole Principle

Lecture 234 - Group of n people

Lecture 235 - Set of n integgers

Lecture 236 - 10 points on an equilateral triangle

Lecture 237 - Pegionhole 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 - Defintion 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 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 - Defintion 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

Lecture 381 - Example 1 : Dogs and Cats

Lecture 382 - Inclusion-Exclusion Formula

Lecture 383 - Proof of Inclusion - Exlusion formula

Lecture 384 - Example 2 : Integer solutions of an equation

Lecture 385 - Example 3 : Words not containing some strings

Lecture 386 - Example 4 : Arranging 3 x's, 3 y's and 3 z's

Lecture 387 - Example 5 : Non-multiples of 2 or 3

Lecture 388 - Example 6 : Integers not divisible by 5, 7 or 11

Lecture 389 - A tip in solving problems

Lecture 390 - Example 7 : A dog nor a cat

Lecture 391 - Example 8 : Brownies, Muffins and Cookies

Lecture 392 - Example 10 : Integer solutions of an equation

Lecture 393 - Example 11 : Seating Arrangement - Part 1

Lecture 394 - Example 11 : Seating Arrangement - Part 2

Lecture 395 - Example 12 : Integer solutions of an equation

Lecture 396 - Number of Onto Functions.

Lecture 397 - Formula for Number of Onto Functions

Lecture 398 - Example 13 : Onto Functions

Lecture 399 - Example 14 : No one in their own house

Lecture 400 - Derangements

Lecture 401 - Derangements of 4 numbers

Lecture 402 - Example 15 : Bottles and caps

Lecture 403 - Example 16 : Self grading

Lecture 404 - Example 17 : Even integers and their places

Lecture 405 - Example 18 : Finding total number of items

Lecture 406 - Example 19 : Devising a secret code

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: Recurrence relation

Lecture 417 - Example - Rabbits on an island

Lecture 418 - Example - n-bit string

Lecture 419 - Example - n-bit string without consecutive zero

Lecture 420 - Solving Linear Recurrence Relations - A theorem

Lecture 421 - A note on the proof

Lecture 422 - Soving recurrence relation - Example 1

Lecture 423 - Soving recurrence relation - Example 2

Lecture 424 - Fibonacci Sequence

Lecture 425 - Introduction to Fibonacci sequence

Lecture 426 - Solution of Fibbonacci sequence

Lecture 427 - A basic introduction to 'complexity'

NPTEL : NOC:Deep Learning (Computer Science and Engineering)

Co-ordinators : Prof.Mitesh Khapra

NPTEL : NOC:Foundations to Computer Systems Design (Computer Science and Engineering)

Co-ordinators : Prof. V. Kamakoti

NPTEL : NOC:Machine Learning for Engineering and Science Applications (Computer Science and Engineering)

Co-ordinators : Prof. Ganapathy, Prof. Balaji Srinivasan

NPTEL : NOC:Information Security 5 - Secure Systems Engineering (Computer Science and Engineering)

Co-ordinators : Prof. Chester Rebeiro

NPTEL : NOC:Multimodal Interaction (Computer Science and Engineering)

Co-ordinators : Dr. Stefan Hillmann, Prof. Dr. Sebastian Moller

NPTEL : NOC:Deep Learning - Part 2 (Computer Science and Engineering)

Co-ordinators : Prof.Mitesh Khapra

NPTEL : NOC:Machine Learning (Computer Science and Engineering)

Co-ordinators : Prof. Henrik Bostrom, Prof. Fredrik Kilander, Prof. Carl Gustaf Jansson

NPTEL : NOC:C Programming and Assembly Language (Computer Science and Engineering)

Co-ordinators : Prof. Janakiraman Viraraghavan

NPTEL : NOC:Applied Natural Language Processing (Computer Science and Engineering)

Co-ordinators : Prof. Ramaseshan R

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

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 architecture and models for multi-language translation

Lecture 83 - Beam Search, Stochatic Gradient Descend, Mini Batch, Batch

Lecture 84 - Beam Search, Stochatic Gradient Descend, 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 Occurence Analogue to Lexical Semantic - COALS

Lecture 91 - Global Vectors - Glove

Lecture 92 - Evaluation of Word vectors

NPTEL : NOC:Python for Data Science (Computer Science and Engineering)

Co-ordinators : Prof. Ragunathan Rengasamy

NPTEL : NOC:Practical Machine Learning with Tensorflow (Computer Science and Engineering)

Co-ordinators : Dr. B. Ravindran

NPTEL : NOC:Introduction to Database Systems (Computer Science and Engineering)

Co-ordinators : Prof. P.Sreenivasa Kumar

NPTEL : NOC:Foundations of Cryptography (Computer Science and Engineering)

Co-ordinators : Prof. Ashish Choudhury

NPTEL : NOC:Modern Application Development (Computer Science and Engineering)

Co-ordinators : Prof. Madhavan Mukund, Prof. Abhijat Vichare, Prof. Aamod Sane

NPTEL : NOC:Deep Learning for Computer Vision (Computer Science and Engineering)

Co-ordinators : Prof. Vineeth N Balasubramanian

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: SIFT and Variants

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: Bag-of-Words and VLAD Representations

Lecture 18 - Image Descriptor Matching

Lecture 19 - Pyramid Matching

Lecture 20 - From Traditional Vision to Deep Learning

Lecture 21 - Neural Networks: A Review - Part 1

Lecture 22 - Neural Networks: A Review - Part 2

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

Lecture 30 - Improving Training of Neural Networks - Part 2

Lecture 31 - Convolutional Neural Networks: An Introduction - Part 1

NPTEL : NOC:Artificial Intelligence Search Methods For Problem Solving (Computer Science and Engineering)

Co-ordinators : Prof. Deepak Khemani

NPTEL : NOC:Computational Complexity (Computer Science and Engineering)

Co-ordinators : Prof. Subrahmanyam Kalyanasundaram

NPTEL : NOC:Parameterized Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. Neeldhara Misra

NPTEL : NOC:Getting Started with Competitive Programming (Computer Science and Engineering)

Co-ordinators : Prof. Neeldhara Misra

NPTEL : NOC:Introduction to Quantum Computing: Quantum Algorithms and Qiskit (Computer Science and Engineering)

Co-ordinators : Prof. Prabha Mandayam

NPTEL : NOC:Systems and Usable Security (Computer Science and Engineering)

Co-ordinators : Prof. Neminath Hubballi

NPTEL : NOC:Online Privacy (Computer Science and Engineering)

Co-ordinators : Prof. Ponnurangam Kumaraguru

NPTEL : NOC:Introduction to Machine Learning (Tamil) (Computer Science and Engineering)

Co-ordinators : Prof. Arun Rajkumar

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

Lecture 30 - Level splitting

Lecture 31 - Measure of Impurity

NPTEL : Compiler Design (Prof. Rupesh Nasre) (Computer Science and Engineering)

Co-ordinators : Prof. Rupesh Nasre

Lecture 32 - Intermdiate Code Generation - Part 4, IR for type expressions

Lecture 33 - Intermdiate Code Generation - Part 4, IR for array expressions

Lecture 34 - Intermdiate Code Generation - Part 4, IR for boolean expressions

Lecture 35 - Intermdiate 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 : NOC:Applied Accelerated Artificial Intelligence (Computer Science and Engineering)

Co-ordinators : Prof. Satyadhyan Chickerur, Prof. Bharatkumar Sharma, Prof. Adesuyi Tosin, Prof. Satyajit Das

NPTEL : NOC:Social Network Analysis (Computer Science and Engineering)

Co-ordinators : Prof. Tanmoy Chakraborty

NPTEL : NOC:Quantum Algorithms and Cryptography (Computer Science and Engineering)

Co-ordinators : Prof. Shweta Agrawal

NPTEL : NOC:Theory of Computation (2023) (Computer Science and Engineering)

Co-ordinators : Prof. Subrahmanyam Kalyanasundaram

NPTEL : NOC:Advanced Computer Networks (Computer Science and Engineering)

Co-ordinators : Prof. Neminath Hubballi, Prof. Sameer Kulkarni

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 Comparision 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

NPTEL : NOC:Affective Computing (Computer Science and Engineering)

Co-ordinators : Prof. Jainendra Shukla, Prof. Abhinav Dhal

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

Lecture 30

Lecture 31

NPTEL : NOC:Optimisation for Machine Learning: Theory and Implementation (Hindi) (Computer Science and Engineering)

Co-ordinators : Prof. Pravesh Biyani

NPTEL : ACM India - RBCDSAI Summer School on DS-AI-ML (Computer Science and Engineering)

Co-ordinators : Multi-Faculty

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 - Part 1

Lecture 58 - Induction to Neural Networks, Perceptrons, Multilayer Perceptrons, Feedforward Neural Networks - Part 2

Lecture 59 - Induction to Neural Networks, Perceptrons, Multilayer Perceptrons, Feedforward Neural Networks - Part 3

Lecture 60 - Induction to Neural Networks, Perceptrons, Multilayer Perceptrons, Feedforward Neural Networks - Part 4

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)

NPTEL : NOC:Machine Learning (ML) in Hindi (Computer Science and Engineering)

Co-ordinators : Prof. Anubha Gupta

NPTEL : NOC:Cyber Security and Privacy (Computer Science and Engineering)

Co-ordinators : Prof. Saji K Mathew

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

Lecture 30 - Privacy regulation - Part 3

Lecture 31 - Privacy regulation in Europe - Part 1

NPTEL : NOC:Business Intelligence and Analytics (Computer Science and Engineering)

Co-ordinators : Prof. Saji K Mathew

NPTEL : NOC:Responsible and Safe AI Systems (Computer Science and Engineering)

Co-ordinators : Prof. Ponnurangam Kumaraguru, Prof. Balaraman Ravindran, Prof. Arun Rajkumar

NPTEL : NOC:Introduction to Cryptology (Computer Science and Engineering)

Co-ordinators : Dr. Sugata Gangopadhyay

NPTEL : NOC:Data Analytics with Python (Computer Science and Engineering)

Co-ordinators : Prof. A. Ramesh

NPTEL : Combinatorics (Computer Science and Engineering)

Co-ordinators : Dr. L. Sunil Chandran

NPTEL : Compiler Design (Prof. Y.N. Srikanth) (Computer Science and Engineering)

Co-ordinators : Prof. Y.N. Srikanth

NPTEL : Graph Theory (Computer Science and Engineering)

Co-ordinators : Dr. L. Sunil Chandran

NPTEL : High Performance Computing (Computer Science and Engineering)

Co-ordinators : Prof. Mathew Jacob

NPTEL : Numerical Optimization (Computer Science and Engineering)

Co-ordinators : Dr. Shirish K. Shevade

NPTEL : Storage Systems (Computer Science and Engineering)

Co-ordinators : Dr. K. Gopinath

NPTEL : System Analysis and Design (Computer Science and Engineering)

Co-ordinators : Prof. V. Rajaraman

NPTEL : Principles of Compiler Design (Computer Science and Engineering)

Co-ordinators : Prof. Y.N. Srikanth

NPTEL : NOC:Discrete Mathematics (IIITB) (Computer Science and Engineering)

Co-ordinators : Prof. Ashish Choudhury

NPTEL : NOC:Secure Computation: Part I (Computer Science and Engineering)

Co-ordinators : Prof. Ashish Choudhury

NPTEL : NOC:Secure Computation - Part II (Computer Science and Engineering)

Co-ordinators : Prof. Ashish Choudhury

NPTEL : NOC:Introduction to Graph Algorithms (Computer Science and Engineering)

Co-ordinators : Prof. C. Pandu Rangan

NPTEL : NOC:Linear Algebra Through Geometry (Computer Science and Engineering)

Co-ordinators : Prof. Ashok Rao, Prof. M Krishna Kumar, Prof. Arulalan M R