

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

NPTEL Video Course - Electrical Engineering - Nonlinear Dynamical Systems

Subject Co-ordinator - Prof. Harish K. Pillai, Prof. Madhu N. Belur

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction

Lecture 2 - First Order systems

Lecture 3 - Classification of Equilibrium points

Lecture 4 - Lipschitz Functions

Lecture 5 - Existence/uniqueness theorems

Lecture 6 - Existence/uniqueness of solutions to differential equations

Lecture 7 - Lyapunov theorem on stability

Lecture 8 - Extension of Lyapunov's Theorem in different contexts

Lecture 9 - LaSalle's Invariance principle, Barbashin and Krasovski theorems, periodic orbits

Lecture 10 - Bendixson criterion and Poincare-Bendixson criterion. Example

Lecture 11 - Bendixson and Poincare-Bendixson criteria van-der-Pol Oscillator

Lecture 12 - Scilab simulation of Lotka Volterra predator prey model, van-der-Pol Oscillator Review of linear

Lecture 13 - Signals, operators

Lecture 14 - Norms of signals, systems (operators), Finite gain L2 stable

Lecture 15 - Nyquist plots and Nyquist criterion for stability

Lecture 16 - Interconnection between linear system & non-linearity, passive filters

Lecture 17 - Passive filters, Dissipation equality, positive real lemma

Lecture 18 - Positive real lemma proof

Lecture 19 - Definition for positive realness and Kalman Yakubovich-Popov Theorem

Lecture 20 - Kalman-Yakubovich-Popov Lemma/theorem and memoryless nonlinearities

Lecture 21 - Loop transformations and circle criterion

Lecture 22 - Nonlinearities based on circle criterion

Lecture 23 - Limit cycles

Lecture 24 - Popov criterion continuous, frequency-domain theorem

Lecture 25 - Popov criterion continuous, frequency-domain theorem

Lecture 26 - Describing function method

Lecture 27 - Describing Function

Lecture 28 - Describing

Lecture 29 - Describing

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- Lecture 30 - Describing functions
- Lecture 31 - Describing functions
- Lecture 32 - Describing functions for nonlinearities
- Lecture 33 - Ideal relay with Hysteresis and dead zone
- Lecture 34 - Dynamical systems on manifolds-1
- Lecture 35 - Dynamical systems on manifolds-2

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

NPTEL Video Course - Electrical Engineering - Power System Dynamics and Control

Subject Co-ordinator - Dr. A.M. Kulkarni

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction

Lecture 2 - Introduction

Lecture 3 - Analysis of Dynamical Systems

Lecture 4 - Analysis of Dynamical Systems (Continued.)

Lecture 5 - Analysis of LINEAR Time Invariant Dynamical Systems

Lecture 6 - Analysis of LINEAR Time Invariant Dynamical Systems (Continued.)

Lecture 7 - Stiff Systems, Multi Time Scale Modeling

Lecture 8 - Numerical Integration

Lecture 9 - Numerical Integration (Continued.)

Lecture 10 - Numerical Integration (Continued.)

Lecture 11 - Modeling of Synchronous Machines

Lecture 12 - Modeling of Synchronous Machines (Continued.)

Lecture 13 - Modeling of Synchronous Machines (Continued.)

Lecture 14 - Modeling of Synchronous Machines. dq0 transformation (Continued.)

Lecture 15 - Modeling of Synchronous Machines. Standard Parameters

Lecture 16 - Modeling of Synchronous Machines. Standard Parameters

Lecture 17 - Synchronous Generator Models using Standard Parameters

Lecture 18 - Synchronous Generator Models using Standard Parameters. PER UNIT REPRESENTATION

Lecture 19 - Open Circuit Response of a Synchronous Generator

Lecture 20 - Synchronous Machine Modeling. Short Circuit Analysis (Continued.)

Lecture 21 - Synchronous Machine Modeling. Short Circuit Analysis (Continued.) Synchronization of a Synchronous Machine

Lecture 22 - Synchronization of a Synchronous Machine (Continued.)

Lecture 23 - Simplified Synchronous Machine Models

Lecture 24 - Excitation Systems

Lecture 25 - Excitation System Modeling

Lecture 26 - Excitation System Modeling. Automatic Voltage Regulator

Lecture 27 - Excitation System Modeling. Automatic Voltage Regulator (Continued.)

Lecture 28 - Excitation System Modeling. Automatic Voltage Regulator (Simulation)

Lecture 29 - Excitation System Modeling. Automatic Voltage Regulator (Simulation) â (Continued.)

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- Lecture 30 - Excitation System Modeling. Automatic Voltage Regulator. Linearized Analysis
- Lecture 31 - Load Modeling
- Lecture 32 - Induction Machines, Transmission Lines
- Lecture 33 - Transmission Lines. Prime Mover Systems
- Lecture 34 - Transmission Lines (Continued.) Prime Mover Systems
- Lecture 35 - Prime Mover Systems. Stability in Integrated Power System
- Lecture 36 - Stability in Integrated Power System
- Lecture 37 - Two Machine System (Continued.)
- Lecture 38 - Stability in Integrated Power System
- Lecture 39 - Frequency/Angular Stability Programs. Stability Phenomena
- Lecture 40 - Voltage Stability Example (Continued.). Fast Transients
- Lecture 41 - Torsional Transients
- Lecture 42 - Sub-Synchronous Resonance. Stability Improvement
- Lecture 43 - Stability Improvement
- Lecture 44 - Stability Improvement. Power System Stabilizers
- Lecture 45 - Stability Improvement (Large Disturbance Stability)

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

NPTEL Video Course - Electrical Engineering - Control Engineering (Prof. S.D. Agashe)

Subject Co-ordinator - Prof. S.D. Agashe

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - The Control Problem
- Lecture 2 - Some More Examples
- Lecture 3 - Different Kinds of Control Systems
- Lecture 4 - History of Feedback
- Lecture 5 - Modern Control Problems
- Lecture 6 - DC Motor Speed Control
- Lecture 7 - System Modelling, Analogy
- Lecture 8 - Causes of System Error
- Lecture 9 - Calculation of Error
- Lecture 10 - Control System Sensitivity
- Lecture 11 - Automatic Control of DC Motor
- Lecture 12 - Proportional Control
- Lecture 13 - Non-Unity Feedback
- Lecture 14 - Signal-Flow Graph
- Lecture 15 - Mason's Gain Formula
- Lecture 16 - Signal-Flow Graph for DC Motor Control
- Lecture 17 - Steady-State Calculations
- Lecture 18 - Differential Equation Model and Laplace Transformation Model
- Lecture 19 - D-Operator Method
- Lecture 20 - Second-Order System Response
- Lecture 21 - Frequency Response
- Lecture 22 - Laplace Transformation Theorems
- Lecture 23 - Final Value Theorem
- Lecture 24 - Transfer Function and Pole-Zero Diagram
- Lecture 25 - 'Good' Poles and 'Bad' Poles
- Lecture 26 - Signal Flow Graph with Transfer Functions
- Lecture 27 - s-Domain and t-Domain
- Lecture 28 - Second-Order System Response in s-Domain
- Lecture 29 - Integral Feedback

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- Lecture 30 - Root-Locus Method
- Lecture 31 - Root-Locus Rules
- Lecture 32 - Asymptotes of Root Locus
- Lecture 33 - Routh Array
- Lecture 34 - Singular Cases
- Lecture 35 - Closed Loop Poles
- Lecture 36 - Controller in the Forwarded Path
- Lecture 37 - Mapping of Control in the Complex-Plane
- Lecture 38 - Encirclement by a Curve
- Lecture 39 - Nyquist Criterion
- Lecture 40 - Application of the Nyquist Criterion
- Lecture 41 - Polar Plot and Bode Plots
- Lecture 42 - Logarithmic Scale for Frequency
- Lecture 43 - 'Asymptotic' DB Gain
- Lecture 44 - Compensating Network
- Lecture 45 - Nichols' Chart
- Lecture 46 - Time Domain Methods of Analysis and Design
- Lecture 47 - State-Variable Equations

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

NPTEL Video Course - Electrical Engineering - Power Electronics

Subject Co-ordinator - Prof. Kishore Chatterjee, Prof. B.G. Fernandes

Co-ordinating Institute - IIT - Bombay

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

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

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

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Lecture 30 - Power Electronics  
Lecture 31 - Power Electronics  
Lecture 32 - Power Electronics  
Lecture 33 - Power Electronics  
Lecture 34 - Power Electronics  
Lecture 35 - Power Electronics  
Lecture 36 - Power Electronics  
Lecture 37 - Power Electronics  
Lecture 38 - Power Electronics  
Lecture 39 - Power Electronics  
Lecture 40 - Power Electronics  
Lecture 41 - Power Electronics  
Lecture 42 - Power Electronics  
Lecture 43 - Power Electronics



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

NPTEL Video Course - Electrical Engineering - Fabrication of Silicon VLSI Circuits using the MOS technology

Subject Co-ordinator - Prof. A.N. Chandorkar

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction Micro to Nano A Journey into Intergrated Circuit Technology
- Lecture 2 - Introduction Micro to Nano A Journey into Intergrated Circuit Technology
- Lecture 3 - Crystal Properties and Silico Growth
- Lecture 4 - Crystal Properties and Silico Growth (Continued...)
- Lecture 5 - IC Fab Labs and Fabrication of IC
- Lecture 6 - Diffusion
- Lecture 7 - Diffusion (Continued...)
- Lecture 8 - Solid State Diffusion
- Lecture 9 - Solid State Diffusion (Continued...)
- Lecture 10 - Solid State Diffusion (Continued...)
- Lecture 11 - Thermal Oxidation of Silicons
- Lecture 12 - Thermal Oxidation of Silicons
- Lecture 13 - Thermal Oxidation of Silicons
- Lecture 14 - Thermal Oxidation of Silicons (Continued...)
- Lecture 15 - Thermal Oxidation of Silicons (Continued...)
- Lecture 16 - Lithography
- Lecture 17 - Lithography
- Lecture 18 - Lithography
- Lecture 19 - ION Implantation
- Lecture 20 - ION Implantation
- Lecture 21 - ION Implantation and Silicon IC Processing Flow for CMOS Technology
- Lecture 22 - ION Implantation and Silicon IC Processing Flow for CMOS Technology
- Lecture 23 - Silicon IC Processing Flow for CMOS Technology
- Lecture 24 - Thin Film Deposition
- Lecture 25 - Thin Film Deposition
- Lecture 26 - Thin Film Deposition
- Lecture 27 - Thin Film Deposition and Etching in VLSI Processing
- Lecture 28 - Etching in VLSI Processing and Back -End Technology

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

NPTEL Video Course - Electrical Engineering - NOC:Computational Electromagnetics and Applications

Subject Co-ordinator - Prof.Krish Sankaran

Co-ordinating Institute - IIT - Bombay

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

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

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Lecture 30 - Lecture 15  
Lecture 31 - Lecture 16  
Lecture 32 - Lecture 17  
Lecture 33 - Lecture 18  
Lecture 34 - Exercise 10  
Lecture 35 - Summary week 5  
Lecture 36 - Lecture 19  
Lecture 37 - Lecture 20  
Lecture 38 - Lecture 21  
Lecture 39 - Lecture 22  
Lecture 40 - Exercise 11  
Lecture 41 - Summary week 6  
Lecture 42 - Exercise 12  
Lecture 43 - Exercise 13  
Lecture 44 - Exercise 14  
Lecture 45 - Exercise 15  
Lecture 46 - Exercise 16  
Lecture 47 - Exercise 17  
Lecture 48 - Summary week 7  
Lecture 49 - Lecture 23  
Lecture 50 - Lecture 24  
Lecture 51 - Lecture 25  
Lecture 52 - Exercise 18  
Lecture 53 - Exercise 19  
Lecture 54 - Lab tour 3  
Lecture 55 - Summary week 8  
Lecture 56 - Lecture 26  
Lecture 57 - Lecture 27  
Lecture 58 - Lecture 28  
Lecture 59 - Lecture 29  
Lecture 60 - Lecture 30  
Lecture 61 - Lecture 31  
Lecture 62 - Lab tour 4  
Lecture 63 - Summary week 9  
Lecture 64 - Lecture 32  
Lecture 65 - Lecture 33  
Lecture 66 - Lecture 34  
Lecture 67 - Lecture 35  
Lecture 68 - Exercise 20

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Lecture 69 - Lab tour 5  
Lecture 70 - Summary week 10  
Lecture 71 - Lecture 36  
Lecture 72 - Lecture 37  
Lecture 73 - Lecture 38  
Lecture 74 - Lecture 39  
Lecture 75 - Lecture 40  
Lecture 76 - Summary week 11  
Lecture 77 - Lecture 41  
Lecture 78 - Lecture 42  
Lecture 79 - Lecture 43  
Lecture 80 - Lecture 44  
Lecture 81 - Exercise 21  
Lecture 82 - Exercise 22  
Lecture 83 - Summary week 12

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

NPTEL Video Course - Electrical Engineering - NOC:Basic Electronics

Subject Co-ordinator - Prof. Mahesh B. Patil

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - A brief history of electronics  
Lecture 2 - Superposition  
Lecture 3 - Useful circuit techniques - 1  
Lecture 4 - Useful circuit techniques - 2  
Lecture 5 - Phasors - 1  
Lecture 6 - Phasors - 2  
Lecture 7 - RC/RL circuits in time domain - 1  
Lecture 8 - RC/RL circuits in time domain - 2  
Lecture 9 - RC/RL circuits in time domain - 3  
Lecture 10 - RC/RL circuits in time domain - 4  
Lecture 11 - RC/RL circuits in time domain - 5  
Lecture 12 - Simulation of RC circuit  
Lecture 13 - Diode circuits - 1  
Lecture 14 - Diode circuits - 2  
Lecture 15 - Diode circuits - 3  
Lecture 16 - Diode circuits - 4  
Lecture 17 - Diode circuits - 5  
Lecture 18 - Diode circuits - 6  
Lecture 19 - Diode rectifiers - 1  
Lecture 20 - Diode rectifiers - 2  
Lecture 21 - Diode rectifiers - 3  
Lecture 22 - Bipolar Junction Transistor - 1  
Lecture 23 - Bipolar Junction Transistor - 2  
Lecture 24 - Bipolar Junction Transistor - 3  
Lecture 25 - BJT amplifier - 1  
Lecture 26 - BJT amplifier - 2  
Lecture 27 - BJT amplifier - 3  
Lecture 28 - BJT amplifier - 4  
Lecture 29 - BJT amplifier - 5

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

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- Lecture 30 - BJT amplifier - 6
- Lecture 31 - BJT amplifier - 7
- Lecture 32 - Introduction to op-amps
- Lecture 33 - Op-amp circuits - 1
- Lecture 34 - Op-amp circuits - 2
- Lecture 35 - Op-amp circuits - 3
- Lecture 36 - Difference amplifier
- Lecture 37 - Instrumentation amplifier - 1
- Lecture 38 - Instrumentation amplifier - 2
- Lecture 39 - Op-amp nonidealities - 1
- Lecture 40 - Op-amp nonidealities - 2
- Lecture 41 - Bode plots - 1
- Lecture 42 - Bode plots - 2
- Lecture 43 - Bode plots - 3
- Lecture 44 - Op-amp filters
- Lecture 45 - Simulation of op-amp filter
- Lecture 46 - Precision rectifiers - 1
- Lecture 47 - Precision rectifiers - 2
- Lecture 48 - Precision rectifiers - 3
- Lecture 49 - Simulation of triangle-to-sine converter
- Lecture 50 - Schmitt triggers - 1
- Lecture 51 - Schmitt triggers - 2
- Lecture 52 - Schmitt triggers - 3
- Lecture 53 - Sinusoidal oscillators - 1
- Lecture 54 - Sinusoidal oscillators - 2
- Lecture 55 - Introduction to digital circuits
- Lecture 56 - Boolean algebra
- Lecture 57 - Karnaugh maps
- Lecture 58 - Combinatorial circuits - 1
- Lecture 59 - Combinatorial circuits - 2
- Lecture 60 - Combinatorial circuits - 3
- Lecture 61 - Introduction to sequential circuits
- Lecture 62 - Latch and flip-flop
- Lecture 63 - JK flip-flop
- Lecture 64 - D flip-flop
- Lecture 65 - Shift registers
- Lecture 66 - Counters - 1
- Lecture 67 - Counters - 2
- Lecture 68 - Simulation of a synchronous counter

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- Lecture 69 - 555 timer
- Lecture 70 - Digital-to-analog conversion - 1
- Lecture 71 - Digital-to-analog conversion - 2
- Lecture 72 - Analog-to-digital conversion

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

NPTEL Video Course - Electrical Engineering - NOC:Antennas

Subject Co-ordinator - Prof. Girish Kumar

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Antenna Introduction - I  
Lecture 2 - Antenna Introduction - II  
Lecture 3 - Antenna Introduction - III  
Lecture 4 - Antenna Fundamentals - I  
Lecture 5 - Antenna Fundamentals - II  
Lecture 6 - Antenna Radiation Hazards - I  
Lecture 7 - Antenna Radiation Hazards - II  
Lecture 8 - Dipole Antennas - I  
Lecture 9 - Dipole Antennas - II  
Lecture 10 - Dipole Antennas - III  
Lecture 11 - Monopole Antennas - I  
Lecture 12 - Monopole Antennas - II  
Lecture 13 - Loop Antennas  
Lecture 14 - Slot Antennas  
Lecture 15 - Linear Arrays - I  
Lecture 16 - Linear Arrays - II  
Lecture 17 - Linear Arrays - III  
Lecture 18 - Planar Arrays  
Lecture 19 - Microstrip Antennas (MSA)  
Lecture 20 - Rectangular MSA  
Lecture 21 - MSA Parametric Analysis - I  
Lecture 22 - MSA Parametric Analysis - II  
Lecture 23 - Circular MSA  
Lecture 24 - Broadband MSA - I  
Lecture 25 - Broadband MSA - II  
Lecture 26 - Broadband MSA - III  
Lecture 27 - Broadband MSA - IV  
Lecture 28 - Broadband MSA - V  
Lecture 29 - Compact MSA - I

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- Lecture 30 - Compact MSA - II
- Lecture 31 - Compact MSA - III
- Lecture 32 - Tunable MSA - I
- Lecture 33 - Tunable MSA - II
- Lecture 34 - Circularly Polarized MSA - I
- Lecture 35 - Circularly Polarized MSA - II
- Lecture 36 - Circularly Polarized MSA - III
- Lecture 37 - MSA Arrays - I
- Lecture 38 - MSA Arrays - II
- Lecture 39 - MSA Arrays - III
- Lecture 40 - Helical Antennas - I
- Lecture 41 - Helical Antennas - II
- Lecture 42 - Helical Antennas - III
- Lecture 43 - Helical Antennas - IV
- Lecture 44 - Helical Antennas - V
- Lecture 45 - Horn Antennas - I
- Lecture 46 - Horn Antennas - II
- Lecture 47 - Horn Antennas - III
- Lecture 48 - Horn Antennas - IV
- Lecture 49 - Horn Antennas - V
- Lecture 50 - Yagi-Uda and Log-Periodic Antennas - I
- Lecture 51 - Yagi-Uda and Log-Periodic Antennas - II
- Lecture 52 - Yagi-Uda and Log-Periodic Antennas - III
- Lecture 53 - IE3D Session TA - I
- Lecture 54 - IE3D Session TA - II
- Lecture 55 - IE3D Session TA - III
- Lecture 56 - Reflector Antennas - I
- Lecture 57 - Reflector Antennas - II
- Lecture 58 - Reflector Antennas - III
- Lecture 59 - Reflector Antennas - IV
- Lecture 60 - Lab Session

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

NPTEL Video Course - Electrical Engineering - NOC:Fundamentals of Wavelets, Filter Banks and Time Frequency Analysis

Subject Co-ordinator - Prof. V.M. Gadre

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Module 1 - Lecture 1 - Introduction  
Lecture 2 - Module 1 - Lecture 2 - Origin of Wavelets  
Lecture 3 - Module 1 - Lecture 3 - Haar Wavelet  
Lecture 4 - Module 2 - Lecture 1 - Dyadic Wavelet  
Lecture 5 - Module 2 - Lecture 2 - Dilates and Translates of Haar Wavelets  
Lecture 6 - Module 2 - Lecture 3 - L2 Norm of a Function  
Lecture 7 - Module 3 - Lecture 1 - Piecewise Constant Representation of a Function  
Lecture 8 - Module 3 - Lecture 2 - Ladder of Subspaces  
Lecture 9 - Module 3 - Lecture 3 - Scaling Function for Haar Wavelet Demo  
Lecture 10 - Demonstration 1  
Lecture 11 - Module 4 - Lecture 1 - Vector Representation of Sequences  
Lecture 12 - Module 4 - Lecture 2 - Properties of Norm  
Lecture 13 - Module 4 - Lecture 3 - Parseval's Theorem  
Lecture 14 - Module 5 - Lecture 1 - Equivalence of sequences and functions  
Lecture 15 - Module 5 - Lecture 2 - Angle between Functions and their Decomposition  
Lecture 16 - Demonstration 2  
Lecture 17 - Module 6 - Lecture 1 - Introduction to filter banks  
Lecture 18 - Module 6 - Lecture 2 - Haar Analysis Filter Bank in Z-domain  
Lecture 19 - Module 6 - Lecture 3 - Haar Synthesis Filter Bank in Z-domain  
Lecture 20 - Module 7 - Lecture 1 - Moving from Z-domain to frequency domain  
Lecture 21 - Module 7 - Lecture 2 - Frequency Response of Haar Analysis Low pass Filter bank  
Lecture 22 - Module 7 - Lecture 3 - Frequency Response of Haar Analysis High pass Filter bank  
Lecture 23 - Module 8 - Lecture 1 - Ideal two-band filter bank  
Lecture 24 - Module 8 - Lecture 2 - Disqualification of Ideal filter bank  
Lecture 25 - Module 8 - Lecture 3 - Realizable two-band filter bank  
Lecture 26 - Demonstration 3  
Lecture 27 - Module 9 - Lecture 1 - Relating Fourier transform of scaling function to filter bank  
Lecture 28 - Module 9 - Lecture 2 - Fourier transform of scaling function  
Lecture 29 - Module 9 - Lecture 3 - Construction of scaling and wavelet functions from filter bank

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- Lecture 30 - Demonstration 4
- Lecture 31 - Module 10 - Lecture 1 - Introduction to upsampling and down sampling as Multirate operations
- Lecture 32 - Module 10 - Lecture 2 - Up sampling by a general factor M- a Z-domain analysis.
- Lecture 33 - Module 10 - Lecture 3 - Down sampling by a general factor M- a Z-domain analysis
- Lecture 34 - Module 11 - Lecture 1 - Z domain analysis of 2 channel filter bank.
- Lecture 35 - Module 11 - Lecture 2 - Effect of X (-Z) in time domain and aliasing
- Lecture 36 - Module 11 - Lecture 3 - Consequences of aliasing and simple approach to avoid it
- Lecture 37 - Module 12 - Lecture 1 - Revisiting aliasing and the Idea of perfect reconstruction
- Lecture 38 - Module 12 - Lecture 2 - Applying perfect reconstruction and alias cancellation on Haar MRA
- Lecture 39 - Module 12 - Lecture 3 - Introduction to Daubechies family of MRA
- Lecture 40 - Module 13 - Lecture 1 - Power Complementarity of low pass filter
- Lecture 41 - Module 13 - Lecture 2 - Applying perfect reconstruction condition to obtain filter coefficient
- Lecture 42 - Module 14 - Lecture 1 - Effect of minimum phase requirement on filter coefficients
- Lecture 43 - Module 14 - Lecture 2 - Building compactly supported scaling functions
- Lecture 44 - Module 14 - Lecture 3 - Second member of Daubechies family
- Lecture 45 - Module 15 - Lecture 1 - Fourier transform analysis of Haar scaling and Wavelet functions
- Lecture 46 - Module 15 - Lecture 2 - Revisiting Fourier Transform and Parseval's theorem
- Lecture 47 - Module 15 - Lecture 3 - Transform Analysis of Haar Wavelet function
- Lecture 48 - Module 16 - Lecture 1 - Nature of Haar scaling and Wavelet functions in frequency domain
- Lecture 49 - Module 16 - Lecture 2 - The Idea of Time-Frequency Resolution
- Lecture 50 - Module 16 - Lecture 3 - Some thoughts on Ideal time- frequency domain behavior
- Lecture 51 - Module 17 - Lecture 1 - Defining Probability Density function
- Lecture 52 - Module 17 - Lecture 2 - Defining Mean, Variance and  $\hat{A}$  containment in a given domain $\hat{A}$
- Lecture 53 - Module 17 - Lecture 3 - Example
- Lecture 54 - Module 17 - Lecture 4 - Variance from a slightly different perspective
- Lecture 55 - Module 18 - Lecture 1 - Signal transformations
- Lecture 56 - Module 18 - Lecture 2 - Time-Bandwidth product and its properties
- Lecture 57 - Module 18 - Lecture 3 - Simplification of Time-Bandwidth formulae
- Lecture 58 - Module 19 - Lecture 1 - Introduction
- Lecture 59 - Module 19 - Lecture 2 - Evaluation of Time-Bandwidth product
- Lecture 60 - Module 19 - Lecture 3 - Optimal function in the sense of Time-Bandwidth product
- Lecture 61 - Module 20 - Lecture 1 - Discontent with the  $\hat{A}$  Optimal function $\hat{A}$  .
- Lecture 62 - Module 20 - Lecture 2 - Journey from infinite to finite Time-Bandwidth product of Haar scaling f
- Lecture 63 - Module 20 - Lecture 3 - More insights about Time-Bandwidth product
- Lecture 64 - Module 20 - Lecture 4 - Time-frequency plane
- Lecture 65 - Module 20 - Lecture 5 - Tiling the Time-frequency plane
- Lecture 66 - Module 21 - Lecture 1 - STFT
- Lecture 67 - Module 21 - Lecture 2 - STFT
- Lecture 68 - Module 21 - Lecture 3 - STFT

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

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- Lecture 69 - Module 21 - Lecture 4 - Continuous Wavelet Transform (CWT)
- Lecture 70 - Demonstration 5
- Lecture 71 - Student's Presentation

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

NPTEL Video Course - Electrical Engineering - NOC:Analog Circuits (2017)

Subject Co-ordinator - Prof. Jayanta Mukherjee

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Module 1 - Introduction  
Lecture 2 - Module 2 - Poles and zeros  
Lecture 3 - Module 3 - OP-AMPS  
Lecture 4 - Module 4 - Application of Op-Amps  
Lecture 5 - Module 5 - Inverting amplifier and Non Inverting amplifier  
Lecture 6 - Module 1 - Non Idealities in Op-AMP (Finite Gain, Finite Bandwidth and Slew Rate)  
Lecture 7 - Module 2 - Non Idealities in Op-AMP (Offset Voltage and Bias Current)  
Lecture 8 - Module 3 - Bode Plot  
Lecture 9 - Module 4 - Frequency Response  
Lecture 10 - Module 1 - Frequency Response (High Frequency Response)  
Lecture 11 - Module 2 - Frequency Response example  
Lecture 12 - Module 3 - Feedback  
Lecture 13 - Module 4 - Effects of Feedback  
Lecture 14 - Tutorial 1 and 2  
Lecture 15 - Module 1 - Effect of feedback and stability  
Lecture 16 - Module 2 - Stability  
Lecture 17 - Module 3 - Stability and pole location  
Lecture 18 - Module 4 - Stability and Pole location continuation  
Lecture 19 - Tutorial 3  
Lecture 20 - Module 1 - Gain Margin  $\hat{A}$  An example  
Lecture 21 - Module 2 - Frequency Compensation  
Lecture 22 - Module 3 - Filters  
Lecture 23 - Module 4 - Filter prototypes  
Lecture 24 - Tutorial 4  
Lecture 25 - Tutorial 5  
Lecture 26 - Tutorial 6  
Lecture 27 - Module 1 - Chebyshev Prototype, Filter transformation  
Lecture 28 - Module 2 - Filter Transformations (Continued....)  
Lecture 29 - Module 3 - Active Filters

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

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- Lecture 30 - Module 4 - Non Linear Applications of OPAMPS
- Lecture 31 - Module 5 - Limiter, Diodes
- Lecture 32 - Module 1 - Oscillators
- Lecture 33 - Module 2 - Oscillator Amplitude Control , Quadrature Oscillator
- Lecture 34 - Module 3 - Multivibrators
- Lecture 35 - Module 4 - Multivibrators (Continued...)
- Lecture 36 - Module 5 - Monostable Multivibrator
- Lecture 37 - Module 1 - Zener Effect, Rectifiers
- Lecture 38 - Module 2 - Rectifiers
- Lecture 39 - Module 3 - Clamper, Peak Rectifier, Super diodes
- Lecture 40 - Module 4 - BJT DC Circuits
- Lecture 41 - Module 5 - Current Mirror

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

NPTEL Video Course - Electrical Engineering - NOC: Microwave Theory and Techniques

Subject Co-ordinator - Prof. Girish Kumar

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Microwave Theory and Techniques Introduction - I  
Lecture 2 - Microwave Theory and Techniques Introduction - II  
Lecture 3 - Microwave Theory and Techniques Introduction - III  
Lecture 4 - Effects of Microwaves on Human Body - I  
Lecture 5 - Effects of Microwaves on Human Body - II  
Lecture 6 - Waveguides - I  
Lecture 7 - Waveguides - II  
Lecture 8 - Waveguides - III  
Lecture 9 - Transmission Lines - I  
Lecture 10 - Transmission Lines - II  
Lecture 11 - Smith Chart and Impedance Matching - I  
Lecture 12 - Smith Chart and Impedance Matching - II  
Lecture 13 - Smith Chart and Impedance Matching - III  
Lecture 14 - ABCD - Parameters  
Lecture 15 - S - Parameters  
Lecture 16 - Power Dividers - I  
Lecture 17 - Power Dividers - II  
Lecture 18 - Microwave Couplers - I  
Lecture 19 - Microwave Couplers - II  
Lecture 20 - Microwave Couplers - III  
Lecture 21 - Microwave Filters - I  
Lecture 22 - Microwave Filters - II  
Lecture 23 - Microwave Filters - III  
Lecture 24 - Microwave Filters - IV  
Lecture 25 - Microwave Filters - V  
Lecture 26 - Microwave Diodes  
Lecture 27 - Microwave Attenuators  
Lecture 28 - Microwave RF Switches  
Lecture 29 - Series and Shunt SPDT Switches and Introduction to Phase Shifters

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

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- Lecture 30 - Microwave Phase Shifters
- Lecture 31 - Microwave Transistors
- Lecture 32 - Microwave Amplifiers - I
- Lecture 33 - Microwave Amplifiers - II
- Lecture 34 - Microwave Amplifiers - III
- Lecture 35 - Low Noise Amplifiers - I
- Lecture 36 - Low Noise Amplifiers - II
- Lecture 37 - Power Amplifiers
- Lecture 38 - Microwave Tubes - I
- Lecture 39 - Microwave Tubes - II
- Lecture 40 - Microwave Tubes - III
- Lecture 41 - Microwave Oscillators - I
- Lecture 42 - Microwave Oscillators - II
- Lecture 43 - Microwave Mixers - I
- Lecture 44 - Microwave Mixers - II
- Lecture 45 - Microwave Mixers - III
- Lecture 46 - Fundamentals of Antennas
- Lecture 47 - Dipole, Monopole, loop and Slot Antennas
- Lecture 48 - Linear and Planar Arrays
- Lecture 49 - Microstrip Antennas
- Lecture 50 - Horn and Helical Antennas
- Lecture 51 - Yagi - Uda, Log-Periodic and Reflector Antennas
- Lecture 52 - RF MEMS and Microwave Imaging
- Lecture 53 - Microwave Systems
- Lecture 54 - Microwave Measurements and Lab Demonstration
- Lecture 55 - CST Software Introduction with Filter Design
- Lecture 56 - Power Divider and Combiner Design in CST
- Lecture 57 - Hybrid Coupler Design
- Lecture 58 - Antenna Design and Amplifier Simulation in CST
- Lecture 59 - Mixer Design in NI AWR Software - I
- Lecture 60 - Mixer Design in NI AWR Software - II



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

NPTEL Video Course - Electrical Engineering - NOC:Principles of Digital Communications

Subject Co-ordinator - Prof. S.N. Merchant

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Course Overview
- Lecture 2 - Introduction to Information Theory
- Lecture 3 - Entropy and its properties
- Lecture 4 - Lossless Source Coding Theorem
- Lecture 5 - Prefix Codes and Kraft's Inequality
- Lecture 6 - Huffman Coding
- Lecture 7 - Discrete Memory-less Channels
- Lecture 8 - Channel Capacity - I
- Lecture 9 - Channel Capacity - II
- Lecture 10 - Channel Coding Theorem
- Lecture 11 - Differential Entropy - I
- Lecture 12 - Differential Entropy - II
- Lecture 13 - Channel Capacity - III
- Lecture 14 - Channel Capacity - IV
- Lecture 15 - Summary of Information Theory
- Lecture 16 - Signal Space Representations - I
- Lecture 17 - Signal Space Representations - II
- Lecture 18 - Vector Representation of a Random Process
- Lecture 19 - AWGN Vector Channel
- Lecture 20 - Basics of Signal Detection
- Lecture 21 - ML,MAP Detectors for AWGN Channel
- Lecture 22 - Optimal Receiver
- Lecture 23 - Probability of error for Optimal Receiver
- Lecture 24 - Probability of Error for M-ary Scheme
- Lecture 25 - Pulse Code Modulation
- Lecture 26 - Uniform Quantizer
- Lecture 27 - Step Size and Quantization Noise
- Lecture 28 - Non-uniform Quantizer (Lloyd-Max Quantizer)
- Lecture 29 - Companded Quantization - I

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

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- Lecture 30 - Companded Quantization - II
- Lecture 31 - Differential Pulse Code Modulation DPCM - I
- Lecture 32 - DPCM-II (Linear Prediction)
- Lecture 33 - Delta Modulation
- Lecture 34 - M-ary PCM/PAM - I
- Lecture 35 - M-ary PCM/PAM - II
- Lecture 36 - Line Coding - I
- Lecture 37 - Line Coding - II
- Lecture 38 - Line Coding - III
- Lecture 39 - Pulse Shaping for Zero ISI - I
- Lecture 40 - Pulse Shaping for Zero ISI - II
- Lecture 41 - Pulse Shaping for Zero ISI - III
- Lecture 42 - Partial Response Signaling - I
- Lecture 43 - Partial Response Signaling - II
- Lecture 44 - Principle of Invariance of Probability of Error
- Lecture 45 - Binary ASK and PSK
- Lecture 46 - Binary Frequency Shift Keying - I
- Lecture 47 - Binary Frequency Shift Keying - II
- Lecture 48 - Quadrature Phase Shift Keying - I
- Lecture 49 - Quadrature Phase Shift Keying - II
- Lecture 50 - Quadrature Phase Shift Keying - III
- Lecture 51 - Continuous Phase Frequency Shift Keying
- Lecture 52 - Minimum Shift Keying - I
- Lecture 53 - Minimum Shift Keying - II
- Lecture 54 - M-ary Coherent ASK (M-ASK)
- Lecture 55 - M-ary PSK
- Lecture 56 - M-ary Quadrature Amplitude Modulation (M-QAM)
- Lecture 57 - M-ary FSK
- Lecture 58 - Comparison of M-ary Schemes
- Lecture 59 - Non-coherent BFSK
- Lecture 60 - Differential Phase Shift Keying
- Lecture 61 - Channel Coding - I
- Lecture 62 - Channel Coding - II
- Lecture 63 - Channel Coding - III
- Lecture 64 - Channel Coding
- Lecture 65 - Channel Coding

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

NPTEL Video Course - Electrical Engineering - NOC:Fundamental of Power Electronics

Subject Co-ordinator - Prof. Vivek Agarwal

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Familiarization with Power Electronic Systems
- Lecture 2 - Overview of Basic Power Electronic Circuits from Laymans Point of View
- Lecture 3 - Applications, Definitions, and Nature of Power Electronic Circuits
- Lecture 4 - Components of a Power Electronic System
- Lecture 5 - Analysis of Switched Networks
- Lecture 6 - Review of engineering maths for power electronic circuit analysis
- Lecture 7 - Review of semiconductor physics
- Lecture 8 - P-N Junction
- Lecture 9 - Power Diodes
- Lecture 10 - Thyristors
- Lecture 11 - Motivation for rectifier capacitor filter
- Lecture 12 - Circuit Operation
- Lecture 13 - Designing the circuit
- Lecture 14 - Simulation setup for NgSpice and gEDA schematic capture
- Lecture 15 - Simulating the circuit
- Lecture 16 - Practicals
- Lecture 17 - Inrush current limiting - Intro
- Lecture 18 - Inrush current limiting - Resistor solution
- Lecture 19 - Inrush current limiting - Thermistor solution
- Lecture 20 - Inrush current limiting - Transformer solution
- Lecture 21 - Inrush current limiting - MOSFET solution
- Lecture 22 - Inrush current limiting - Relay, contactor
- Lecture 23 - Three phase rectifier capacitor filter
- Lecture 24 - Simulation - 3 phase rectifier capacitor filter
- Lecture 25 - Power factor - Motivation
- Lecture 26 - Power factor - Discussion
- Lecture 27 - Power factor - Sinusoidal
- Lecture 28 - Power factor for rectifier cap filter
- Lecture 29 - Passive power improvement circuit

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

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- Lecture 30 - Simulation - power factor improvement
- Lecture 31 - Linear regulators - Intro
- Lecture 32 - Shunt regulator
- Lecture 33 - Example on shunt regulator
- Lecture 34 - Non-ideality and solution
- Lecture 35 - Applications of shunt regulator
- Lecture 36 - Series regulator
- Lecture 37 - Efficiency of series
- Lecture 38 - Negative and dual voltage regulators
- Lecture 39 - Over current limiting circuits
- Lecture 40 - Improvements to series regulator
- Lecture 41 - Regulator performance parameters
- Lecture 42 - Datasheet of few IC regulators
- Lecture 43 - Common IC regulator circuits
- Lecture 44 - Practicals 1
- Lecture 45 - Switched mode DC-DC converter intro
- Lecture 46 - Volt-sec and Amp-sec balance
- Lecture 47 - Input-output relationship
- Lecture 48 - Buck converter - operation and waveforms
- Lecture 49 - Buck converter - component selection
- Lecture 50 - Primary configurations
- Lecture 51 - Boost converter
- Lecture 52 - Buck-Boost converter
- Lecture 53 - Simulating the primary converters
- Lecture 54 - Forward converter
- Lecture 55 - Core reset in forward converter
- Lecture 56 - Simulating with lossy core reset
- Lecture 57 - Simulating with lossless core reset
- Lecture 58 - Flyback converter
- Lecture 59 - Simulating the flyback converter
- Lecture 60 - Octave mfile for design
- Lecture 61 - Magnetics design intro
- Lecture 62 - Magnetics review
- Lecture 63 - Permeance
- Lecture 64 - Inductor value and energy storage
- Lecture 65 - Inductor area product
- Lecture 66 - Inductor design
- Lecture 67 - Inductor example
- Lecture 68 - Transformer design

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

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- Lecture 69 - Transformer example
- Lecture 70 - Forward converter design mfile
- Lecture 71 - Pushpull converter
- Lecture 72 - Flux walking in pushpull
- Lecture 73 - PWM generation
- Lecture 74 - Simulation of pushpull converter
- Lecture 75 - Half bridge converter
- Lecture 76 - Simulation of halfbridge converter
- Lecture 77 - Full bridge converter
- Lecture 78 - Simulation of fullbridge converter
- Lecture 79 - Area products and mfiles
- Lecture 80 - Intro for drive circuits
- Lecture 81 - BJT base drive
- Lecture 82 - BJT base drive example
- Lecture 83 - Multi-stage base drive
- Lecture 84 - Base drive with speed-up circuit
- Lecture 85 - Base drive with isolation
- Lecture 86 - MOSFET gate drive
- Lecture 87 - MOSFET drive with isolation
- Lecture 88 - Over-current protection
- Lecture 89 - Snubber circuits
- Lecture 90 - Intro for close loop control
- Lecture 91 - Close looping dc-dc converters
- Lecture 92 - Simulation of close loop control
- Lecture 93 - Current control for battery charger application
- Lecture 94 - Instability in current control and slope compensation
- Lecture 95 - Slope compensated current control
- Lecture 96 - Simulation of current control
- Lecture 97 - Single phase inverter with sinusoidal pwm
- Lecture 98 - Simulation of sinusoidal PWM

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

NPTEL Video Course - Electrical Engineering - NOC:Electrical Equipment and Machines: Finite Element Analysis

Subject Co-ordinator - Prof. Shrikrishna V. Kulkarni

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Course Outline and Introduction

Lecture 2 - Analytical and Numerical Methods

Lecture 3 - Revisiting EM Concepts

Lecture 4 - Revisiting EM Concepts

Lecture 5 - Revisiting EM Concepts

Lecture 6 - Revisiting EM Concepts

Lecture 7 - Revisiting EM Concepts

Lecture 8 - Revisiting EM Concepts

Lecture 9 - Revisiting EM Concepts

Lecture 10 - Revisiting EM Concepts

Lecture 11 - FEM

Lecture 12 - Finding Functional for PDEs

Lecture 13 - Whole Domain Approximation

Lecture 14 - 1D FEM

Lecture 15 - 1D FEM

Lecture 16 - 1D FEM

Lecture 17 - 2D FEM

Lecture 18 - 2D FEM

Lecture 19 - 2D FEM Scilab Code

Lecture 20 - 2D FEM Code

Lecture 21 - Computation of B and H Field and Method of Weighted Residuals

Lecture 22 - Galerkin Method

Lecture 23 - Calculation of Leakage Inductance of a Transformer

Lecture 24 - Calculation of Inductance of an Induction Motor and a Gapped-Core Shunt Reactor

Lecture 25 - Insulation Design Using FE Analysis

Lecture 26 - Quadratic Finite Elements

Lecture 27 - Time Harmonic FE Analysis

Lecture 28 - Calculation of Eddy Current Losses

Lecture 29 - Eddy Losses in Transformer Windings

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

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- Lecture 30 - Torque Speed Characteristics of an Induction Motor and FE Analysis of Axisymmetric Problem
- Lecture 31 - Permanent Magnets
- Lecture 32 - Permanent Magnets
- Lecture 33 - Periodic and Antiperiodic Boundary Conditions in Rotating Machines
- Lecture 34 - FE Analysis of Rotating Machines
- Lecture 35 - Voltage Fed Coupled Circuit Field Analysis
- Lecture 36 - Current Fed Coupled Circuit Field Analysis
- Lecture 37 - Transient FE Analysis
- Lecture 38 - Nonlinear FE Analysis
- Lecture 39 - Computation of Forces using Maxwell Stress Tensor
- Lecture 40 - Computation of force using virtual work method

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

NPTEL Video Course - Electrical Engineering - NOC:Digital Signal Processing and its Applications

Subject Co-ordinator - Prof. V. M. Gadre

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction: Digital signal processing and its objectives
- Lecture 2 - Introduction to sampling and Fourier Transform
- Lecture 3 - Sampling of sine wave and associate complication
- Lecture 4 - Review of Sampling Theorem
- Lecture 5 - Idealized Sampling, Reconstruction
- Lecture 6 - Filters And Discrete System
- Lecture 7 - Answering questions from previous lectures
- Lecture 8 - Desired requirements for discrete system
- Lecture 9 - Introduction to phasors
- Lecture 10 - Advantages of phasors in discrete systems
- Lecture 11 - What do we want from a discrete system?
- Lecture 12 - Linearity - Homogeneity and Additivity
- Lecture 13 - Shift Invariance and Characterization of LTI systems
- Lecture 14 - Characterization of LSI system using its impulse response
- Lecture 15 - Introduction to convolution
- Lecture 16 - Convolution: Deeper ideas and understanding
- Lecture 17 - Characterisation of LSI systems, Convolution-properties
- Lecture 18 - Response of LSI Systems to Complex Sinusoids
- Lecture 19 - Convergence of Convolution and Bibo Stability
- Lecture 20 - Commutativity and Associativity
- Lecture 21 - BIBO Stability of an LSI system
- Lecture 22 - Causality and memory of an LSI system
- Lecture 23 - Frequency response of an LSI system
- Lecture 24 - Introduction and conditions of Stability
- Lecture 25 - Vectors and Inner Product
- Lecture 26 - Interpretation of Frequency Response as Dot Product
- Lecture 27 - Interpretation of Frequency Response as Eigenvalues
- Lecture 28 - Discrete time fourier transform
- Lecture 29 - DTFT in LSI System and Convolution Theorem.

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

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- Lecture 30 - Definitions of sequences and Properties of DTFT
- Lecture 31 - Introduction to DTFT, IDTFT
- Lecture 32 - Dual to convolution property
- Lecture 33 - Multiplication Property, Introduction to Parseval's theorem
- Lecture 34 - Introduction and Property of DTFT
- Lecture 35 - Review of Inverse DTFT
- Lecture 36 - Parseval's Theorem and energy and time spectral density
- Lecture 37 - Discussion on Unit Step
- Lecture 38 - Introduction to Z transform
- Lecture 39 - Example of Z transform
- Lecture 40 - Region of Convergence
- Lecture 41 - Properties of Z transform
- Lecture 42 - Z- Transform
- Lecture 43 - Rational System
- Lecture 44 - Introduction and Examples of Rational Z Transform and their Inverses
- Lecture 45 - Double Pole Examples and their Inverse Z Transform
- Lecture 46 - Partial Fraction Decomposition
- Lecture 47 - LSI System Examples
- Lecture 48 - Why are Rational Systems so important?
- Lecture 49 - Solving Linear constant coefficient difference equations which are valid over a finite range of
- Lecture 50 - Introduction to Resonance in Rational Systems
- Lecture 51 - Characterization of Rational LSI system
- Lecture 52 - Causality and stability of the ROC of the system function
- Lecture 53 - Recap of Rational Systems and Discrete Time Filters
- Lecture 54 - Specifications for Filter Design
- Lecture 55 - Four Ideal Piecewise Constant Filters
- Lecture 56 - Important Characteristics Of Ideal Filters
- Lecture 57 - Synthesis of Discrete Time Filters, Realizable specifications
- Lecture 58 - Realistic Specifications for low pass filter. Filter Design Process
- Lecture 59 - Introduction to Filter Design. Analog IIR Filter, FIR discrete-time filter, IIR discrete-time fil
- Lecture 60 - Analog to discrete transform
- Lecture 61 - Intuitive transforms, Bilinear Transformation
- Lecture 62 - Steps for IIR filter design
- Lecture 63 - Analog filter design using Butterworth Approximation
- Lecture 64 - Butterworth filter Derivation And Analysis of butterworth system function
- Lecture 65 - Chebychev filter Derivation
- Lecture 66 - Midsem paper review discussion
- Lecture 67 - The Chebyshev Approximation
- Lecture 68 - Next step in design: Obtain poles

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

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- Lecture 69 - Introduction to Frequency Transformations in the Analog Domain
- Lecture 70 - High pass transformation
- Lecture 71 - Band pass transformation
- Lecture 72 - Frequency Transformation
- Lecture 73 - Different types of filters
- Lecture 74 - Impulse invariant method and ideal impulse response
- Lecture 75 - Design of FIR of length  $(2N+1)$  by the truncation method, Plotting the function  $V(w)$
- Lecture 76 - IIR filter using rectangular window, IIR filter using triangular window
- Lecture 77 - Proof that frequency response of an fir filter using rectangular window function centred at 0 is
- Lecture 78 - Introduction to window functions
- Lecture 79 - Examples of window functions
- Lecture 80 - Explanation of Gibb's Phenomenon and its application
- Lecture 81 - Comparison of FIR And IIR Filter's
- Lecture 82 - Comparison of FIR And IIR Filter's
- Lecture 83 - Comparison of FIR And IIR Filter's
- Lecture 84 - Introduction and approach to realization (causal rational system)
- Lecture 85 - Comprehension of Signal Flow Graphs and Achievement of Pseudo Assembly Language Code
- Lecture 86 - Introduction to IIR Filter Realization and Cascade Structure
- Lecture 87 - Cascade Parallel Structure
- Lecture 88 - Lattice Structure
- Lecture 89 - Recap And Review of Lattice Structure, Realization of FIR Function
- Lecture 90 - Backward recursion, Change in the recursive equation of lattice
- Lecture 91 - Lattice structure for an arbitrary rational system
- Lecture 92 - Example realization of lattice structure for rational system
- Lecture 93 - Introductory Remarks of Discrete Fourier Transform and Frequency Domain Sampling
- Lecture 94 - Principle of Duality, The Circular Convolution

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

NPTEL Video Course - Electrical Engineering - NOC:Stochastic Control and Communication

Subject Co-ordinator - Prof. Ankur A. Kulkarni

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Decision Making under Uncertainty
- Lecture 2 - Expected Utility Theory - I
- Lecture 3 - Expected Utility Theory - II
- Lecture 4 - Expected Utility Theory - III
- Lecture 5 - Role of Information in Decision Making
- Lecture 6 - State Space Modelling of Sequential Decision Making, Example of Inventory Control
- Lecture 7 - Inventory Control Problem (Continued...)
- Lecture 8 - Policy-A Closed Loop Solution to Stochastic Control Problem
- Lecture 9 - Introduction to Markov Decision Processes (MDP)
- Lecture 10 - Types of Policy in MDP
- Lecture 11 - Interpreting randomised decision rules
- Lecture 12 - Stationary Transition Probability: State Diagram Representation and example of Markov policies
- Lecture 13 - Example of History Dependent Policies
- Lecture 14 - Complexity of the problem using brute force approach
- Lecture 15 - Principle of Optimality
- Lecture 16 - Dynamic Programming Algorithm
- Lecture 17 - DP Algo applied to Inventory Control Problem
- Lecture 18 - DP Algo applied to Inventory Control Problem (Continued...)
- Lecture 19 - DP Algo applied to Inventory Control Problem (Continued...)
- Lecture 20 - Optimal Stopping Problem
- Lecture 21 - Optimal Stopping Example: Secretary Problem
- Lecture 22 - Optimal Stopping Example: Secretary Problem (Continued...)
- Lecture 23 - Optimal Stopping Example: Secretary Problem (Continued...)
- Lecture 24 - Linear System Quadratic Cost Problem
- Lecture 25 - Linear System Quadratic Cost Problem (Continued...)
- Lecture 26 - Solving it via DP algorithm (Continued...)
- Lecture 27 - Equivalence between Optimal HR Policy and optimal Markov Deterministic Policy
- Lecture 28 - Stochastic Control under incomplete state information
- Lecture 29 - Stochastic Control under incomplete state information (Continued...)

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

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- Lecture 30 - Stochastic Control under incomplete state information: Example
- Lecture 31 - Stochastic Control under incomplete state information: Example (Continued...)
- Lecture 32 - Stochastic Control under incomplete state information: Example (Continued...)
- Lecture 33 - Stochastic Control under incomplete state information: Example (Continued...)
- Lecture 34 - LQ systems with Imperfect Information - I
- Lecture 35 - LQ systems with Imperfect Information - II
- Lecture 36 - LQ systems with Imperfect Information - III
- Lecture 37 - LQ systems with Imperfect Information - IV
- Lecture 38 - Filtering - I
- Lecture 39 - Filtering - II
- Lecture 40 - Kalman Filtering - I
- Lecture 41 - Kalman Filtering - II
- Lecture 42 - Kalman Filtering - III
- Lecture 43 - Belief State Formulation - I
- Lecture 44 - Belief State Formulation - II
- Lecture 45 - Information Structures - I
- Lecture 46 - Information Structures - II
- Lecture 47 - Witsenhausen Problem - I
- Lecture 48 - Witsenhausen Problem - II
- Lecture 49 - Witsenhausen Problem - III
- Lecture 50 - Witsenhausen Problem - IV
- Lecture 51 - Witsenhausen Problem - V
- Lecture 52 - Witsenhausen Problem - VI
- Lecture 53 - Witsenhausen Problem - VII
- Lecture 54 - Team Decision Theory - I
- Lecture 55 - Team Decision Theory - II
- Lecture 56 - Team Decision Theory - III
- Lecture 57 - Team Decision Theory - IV
- Lecture 58 - Team Decision Theory - V
- Lecture 59 - Team Decision Theory - VI
- Lecture 60 - Team Decision Theory - VII
- Lecture 61 - Communication Theory - I
- Lecture 62 - Communication Theory - II
- Lecture 63 - Communication Theory - III
- Lecture 64 - Communication Theory - IV
- Lecture 65 - Communication Theory - V

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

NPTEL Video Course - Electrical Engineering - NOC:Applied Linear Algebra (2024)

Subject Co-ordinator - Prof. Dwaipayan Mukherjee

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction - Part A  
Lecture 2 - Introduction - Part B  
Lecture 3 - Introduction - Part C  
Lecture 4 - Equivalent Systems - Part A  
Lecture 5 - Equivalent Systems - Part B  
Lecture 6 - Equivalent Systems - Part C  
Lecture 7 - Solution of  $Ax = b$  - Part A  
Lecture 8 - Solution of  $Ax = b$  - Part B  
Lecture 9 - Solution of  $Ax = b$  - Part C  
Lecture 10 - Rings, Integral Domains and Fields - Part A  
Lecture 11 - Rings, Integral Domains and Fields - Part B  
Lecture 12 - Rings, Integral Domains and Fields - Part C  
Lecture 13 - Vector Spaces and Subspaces - Part A  
Lecture 14 - Vector Spaces and Subspaces - Part B  
Lecture 15 - Vector Spaces and Subspaces - Part C  
Lecture 16 - Unions, Intersection, Sums of Subspaces - Part A  
Lecture 17 - Unions, Intersection, Sums of Subspaces - Part B  
Lecture 18 - Generating sets, Linear independence and basis - Part A  
Lecture 19 - Generating sets, Linear independence and basis - Part B  
Lecture 20 - Generating sets, Linear independence and basis - Part C  
Lecture 21 - Ordered basis and co-ordinates - Part A  
Lecture 22 - Ordered basis and co-ordinates - Part B  
Lecture 23 - Ordered basis and co-ordinates - Part C  
Lecture 24 - Rank-Nullity Theorem (Matrices) - Part A  
Lecture 25 - Rank-Nullity Theorem (Matrices) - Part B  
Lecture 26 - Rank-Nullity Theorem (Matrices) - Part C  
Lecture 27 - Rank-Nullity Theorem (Linear Transformation) - Part A  
Lecture 28 - Rank-Nullity Theorem (Linear Transformation) - Part B  
Lecture 29 - Rank-Nullity Theorem (Linear Transformation) - Part C

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

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- Lecture 30 - Isomorphism and Inverses - Part A
- Lecture 31 - Isomorphism and Inverses - Part B
- Lecture 32 - Isomorphism and Inverses - Part C
- Lecture 33 - Dual Basis and Annihilator - Part A
- Lecture 34 - Dual Basis and Annihilator - Part B
- Lecture 35 - Dual Basis and Annihilator - Part C
- Lecture 36 - Dual maps and double dual - Part A
- Lecture 37 - Dual maps and double dual - Part B
- Lecture 38 - Dual maps and double dual - Part C
- Lecture 39 - Quotient spaces and quotient map - Part A
- Lecture 40 - Quotient spaces and quotient map - Part B
- Lecture 41 - Quotient spaces and quotient map - Part C
- Lecture 42 - Inner Product Spaces - Part A
- Lecture 43 - Inner Product Spaces - Part B
- Lecture 44 - Inner Product Spaces - Part C
- Lecture 45 - Gram Schmidt Procedure - Part A
- Lecture 46 - Gram Schmidt Procedure - Part B
- Lecture 47 - Gram Schmidt Procedure - Part C
- Lecture 48 - Best Approximation of a Vector - Part A
- Lecture 49 - Best Approximation of a Vector - Part B
- Lecture 50 - Best Approximation of a Vector - Part C
- Lecture 51 - Projection map and summary of  $Ax = b$  - Part A
- Lecture 52 - Projection map and summary of  $Ax = b$  - Part B
- Lecture 53 - Projection map and summary of  $Ax = b$  - Part C
- Lecture 54 - Linear Differential Equations - Part A
- Lecture 55 - Linear Differential Equations - Part B
- Lecture 56 - Introduction to Eigen values and Eigen vectors - Part A
- Lecture 57 - Introduction to Eigen values and Eigen vectors - Part B
- Lecture 58 - Introduction to Eigen values and Eigen vectors - Part C
- Lecture 59 - Singular Value Decomposition - Part A
- Lecture 60 - Singular Value Decomposition - Part B
- Lecture 61 - Singular Value Decomposition - Part C
- Lecture 62 - Algebraic and geometric multiplicities - Part A
- Lecture 63 - Algebraic and geometric multiplicities - Part B
- Lecture 64 - A-Invariant Subspaces - Part A
- Lecture 65 - A-Invariant Subspaces - Part B
- Lecture 66 - A-Invariant Subspaces - Part C
- Lecture 67 - Minimal Polynomial-I - Part A
- Lecture 68 - Minimal Polynomial-I - Part B

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

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- Lecture 69 - Minimal Polynomial-I - Part C
- Lecture 70 - Minimal Polynomial-I - Part D
- Lecture 71 - Minimal Polynomial-II - Part A
- Lecture 72 - Minimal Polynomial-II - Part B
- Lecture 73 - Minimal Polynomial-II - Part C
- Lecture 74 - Minimal Polynomial-II - Part D
- Lecture 75 - Cayley Hamilton Theorem - Part A
- Lecture 76 - Cayley Hamilton Theorem - Part B
- Lecture 77 - Cayley Hamilton Theorem - Part C
- Lecture 78 - Jordan Canonical Form - Part A
- Lecture 79 - Jordan Canonical Form - Part B
- Lecture 80 - Jordan Canonical Form - Part C
- Lecture 81 - Algebraic Graph Theory and Consensus - Part A
- Lecture 82 - Algebraic Graph Theory and Consensus - Part B
- Lecture 83 - Algebraic Graph Theory and Consensus - Part C
- Lecture 84 - Positive Matrices and Leontieff's Model - Part A
- Lecture 85 - Positive Matrices and Leontieff's Model - Part B

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

NPTEL Video Course - Electrical Engineering - NOC:Digital Communication using GNU Radio

Subject Co-ordinator - Prof. Kumar Appaiah

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction to Digital Communication
- Lecture 2 - Understanding GNU Radio features for Digital Communication: Basic blocks, input and output
- Lecture 3 - Understanding GNU Radio features for Digital Communication: Advanced blocks, hardware interfacing
- Lecture 4 - Fundamentals of Digital Communication: Signal Processing methods, vectors, and relevant GNU Radio
- Lecture 5 - Fundamentals of Digital Communication: Signal Processing methods, vectors, and relevant GNU Radio
- Lecture 6 - Complex Baseband Signal Representation
- Lecture 7 - Real Passband Signal Representation, Up and Down Conversion of Complex Baseband Signals
- Lecture 8 - Random Variables and Random Processes
- Lecture 9 - Fundamentals of Digital Modulation
- Lecture 10 - Linear Modulation Methods: Amplitude Shift Keying (ASK)
- Lecture 11 - Linear Modulation Methods: Phase Shift Keying (PSK)
- Lecture 12 - Linear Modulation Methods: Quadrature Amplitude Modulation (QAM) and Frequency Shift Keying (FSK)
- Lecture 13 - Pulse Shaping for ISI Free Signaling
- Lecture 14 - ASK using Raised Cosine (RC) and Root-Raised Cosine (RRC) Pulse Shaping
- Lecture 15 - Basics of Detection: Properties of Gaussian Random Variables
- Lecture 16 - Basics of Detection: Gaussian Random Vectors and Hypothesis Testing
- Lecture 17 - Optimal Receivers for M-ary Signaling
- Lecture 18 - Gram-Schmidt Orthogonalisation
- Lecture 19 - Optimal Reception of M-ary Signals in AWGN
- Lecture 20 - Detection and Optimal Decision for On-Off Signaling in AWGN Channel
- Lecture 21 - Detection and Optimal Decision for M-ary Signaling
- Lecture 22 - Python for GNU Radio
- Lecture 23 - Extending GNU Radio Features using Python
- Lecture 24 - Constructing and Visualising Constellations using GNU Radio
- Lecture 25 - Understanding matched filtering using GNU Radio
- Lecture 26 - Histograms in GNU Radio
- Lecture 27 - Visualising Symbol Error Rate in GNU Radio
- Lecture 28 - Signal-to-Noise Ratio and Symbol Error Probability - Part 1
- Lecture 29 - Signal-to-Noise Ratio and Symbol Error Probability - Part 2

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

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- Lecture 30 - Symbol error rate and Bit error rate
- Lecture 31 - Computing bit error rates in GNU Radio
- Lecture 32 - End-to-end Digital Communication System Simulation in GNU Radio
- Lecture 33 - Parameter Estimation for Practical Receivers - Part 1
- Lecture 34 - Parameter Estimation for Practical Receivers - Part 2
- Lecture 35 - Phase Locked Loop and Differential Modulation
- Lecture 36 - Maximum Likelihood delay estimate for a single symbol in GNU Radio
- Lecture 37 - Maximum Likelihood delay estimate for multiple symbols in GNU Radio
- Lecture 38 - Phase offset estimation in GNU Radio
- Lecture 39 - Phase Locked Loop in GNU Radio
- Lecture 40 - Costas Loop and Differential PSK in GNU Radio
- Lecture 41 - Channel Equalisation
- Lecture 42 - Detection Strategy for Dispersive Channels
- Lecture 43 - Maximum Likelihood sequence estimation: Viterbi Algorithm
- Lecture 44 - Suboptimal Channel Equalisation: Zero-forcing Receiver
- Lecture 45 - Zero forcing Receiver in GNU Radio
- Lecture 46 - Suboptimal Channel Equalisation: Linear Minimum mean-square error receiver
- Lecture 47 - LMMSE Receiver in GNU Radio
- Lecture 48 - Parallelising Frequency Selective Channels
- Lecture 49 - Orthogonal Frequency Division Multiplexing (OFDM)
- Lecture 50 - OFDM in the presence of dispersive channels
- Lecture 51 - Equalisation using OFDM in GNU Radio
- Lecture 52 - Error Control Coding: Parity Check Codes
- Lecture 53 - Error Control Coding: Repetition Codes
- Lecture 54 - Error Control Coding: Linear Block Codes
- Lecture 55 - Repetition Codes in GNU Radio
- Lecture 56 - Error Control Coding: Perfect Codes
- Lecture 57 - Error Control Coding: Hamming Codes
- Lecture 58 - (7,4) Hamming Code in GNU Radio
- Lecture 59 - Rate and error-free Communication
- Lecture 60 - Quantisation
- Lecture 61 - Visualising Quantisation in GNU Radio
- Lecture 62 - Course Summary

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

NPTEL Video Course - Electrical Engineering - Circuit Theory

Subject Co-ordinator - Prof. S.C. Dutta Roy

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Review of Signals and Systems  
Lecture 2 - Review of Signals and Systems  
Lecture 3 - Network Equations; Initial and Final Conditions  
Lecture 4 - Problem Session 1  
Lecture 5 - Step, Impulse and Complete Responses  
Lecture 6 - 2nd Order Circuits  
Lecture 7 - Transformer Transform Domain Analysis  
Lecture 8 - Problem Session 2  
Lecture 9 - Network Theorems and Network Functions  
Lecture 10 - Network Functions (Continued.)  
Lecture 11 - Amplitude and Phase of Network Functions  
Lecture 12 - Problem Session 3  
Lecture 13 - Poles, Zeros and Network Response  
Lecture 14 - Single Tuned Circuits  
Lecture 15 - Single Tuned Circuits (Continued.)  
Lecture 16 - Double Tuned Circuits  
Lecture 17 - Double Tuned Circuits (Continued.)  
Lecture 18 - Problem Session 4  
Lecture 19 - Double Tuned Circuits (Continued.)  
Lecture 20 - Concept of Delay and Introduction  
Lecture 21 - Two-port Networks (Continued.)  
Lecture 22 - Problem Session 5  
Lecture 23 - Minor - 1  
Lecture 24 - The Hybrid & Transmission Parameters of 2 ports  
Lecture 25 - Problem Session 6  
Lecture 26 - Two - port Network parameters  
Lecture 27 - Two-port Interconnections  
Lecture 28 - Interconnection of Two-port Networks (Continued.)  
Lecture 29 - Problem Session 7

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

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- Lecture 30 - Scattering Matrix
- Lecture 31 - Scattering Parameters of a Two-port
- Lecture 32 - Problem Session 8
- Lecture 33 - Solutions of Minor - 2 Problems
- Lecture 34 - Insertion Loss
- Lecture 35 - Example of Insertion Loss and Elements
- Lecture 36 - Elements of Realizability Theory (Continued.)
- Lecture 37 - Positive Real Functions
- Lecture 38 - Testing of Positive Real Functions
- Lecture 39 - Problem Session 9
- Lecture 40 - More on PRF's and their Synthesis
- Lecture 41 - LC Driving Point Functions
- Lecture 42 - LC Driving Point Synthesis (Continued.)
- Lecture 43 - RC and RL Driving Point Synthesis
- Lecture 44 - Problem Session 10
- Lecture 45 - RC & RL One-port Synthesis (Continued.)
- Lecture 46 - Elementary RLC One-port Synthesis
- Lecture 47 - Properties and Synthesis of Transfer Parameters
- Lecture 48 - Resistance Terminated LC Ladder
- Lecture 49 - Resistance Terminated LC Ladder (Continued.)
- Lecture 50 - Problem session 11
- Lecture 51 - Network Transmission Criteria

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

NPTEL Video Course - Electrical Engineering - Control Engineering (Prof. M. Gopal)

Subject Co-ordinator - Prof. M. Gopal

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Introduction to control problem

Lecture 2 - Basic Feedback Structure

Lecture 3 - Introduction to Control Problem (Continued.)

Lecture 4 - Dynamic Systems and Dynamic Response

Lecture 5 - Dynamic Systems and Dynamic Response (Continued.)

Lecture 6 - Dynamic Systems and Dynamic Response (Continued.)

Lecture 7 - Dynamic Systems and Dynamic Response (Continued.)

Lecture 8 - Dynamic Systems and Dynamic Response (Continued.)

Lecture 9 - Dynamic Systems and Dynamic Response (Continued.)

Lecture 10 - Models of Industrial Control Devices and Systems

Lecture 11 - Models of Industrial Control Devices and Systems (Continued.)

Lecture 12 - Models of Industrial Control Devices and Systems( Continued.)

Lecture 13 - Models of Industrial Control Devices and Systems( Continued.)

Lecture 14 - Models of Industrial Control Devices and Systems( Continued.)

Lecture 15 - Models of Industrial Control Devices and Systems( Continued.)

Lecture 16 - Models of Industrial Control Devices and Systems (Continued.)

Lecture 17 - Models of Industrial Control Devices and Systems (Continued.)

Lecture 18 - Models of Industrial Control Devices and Systems (Continued.)

Lecture 19 - Basic Principles of Feedback Control

Lecture 20 - Basic Principles of Feedback Control (Continued.)

Lecture 21 - Basic Principles of Feedback Control (Continued.)

Lecture 22 - Basic Principles of Feedback Control (Continued.)

Lecture 23 - Concepts of stability and Routh Stability Criterion

Lecture 24 - Concepts of stability and Routh Stability Criterion (Continued.)

Lecture 25 - Concepts of stability and Routh Stability Criterion (Continued.)

Lecture 26 - The Performance of Feedback Systems

Lecture 27 - The Performance of Feedback Systems (Continued.)

Lecture 28 - The Performance of Feedback Systems (Continued.)

Lecture 29 - The Performance of Feedback Systems (Continued.)

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

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- Lecture 30 - Compensator Design Using Root Locus Plots
- Lecture 31 - Compensator Design Using Root Locus Plots (Continued.)
- Lecture 32 - Compensator Design Using Root Locus Plots (Continued.)
- Lecture 33 - Compensator Design Using Root Locus Plots (Continued.)
- Lecture 34 - Compensator Design Using Root Locus Plots (Continued.)
- Lecture 35 - The Nyquist Stability Criterion and Stability Margins
- Lecture 36 - The Nyquist Stability Criterion and Stability Margins (Continued.)
- Lecture 37 - The Nyquist Stability Criterion and Stability Margins (Continued.)
- Lecture 38 - The Nyquist Stability Criterion and Stability Margins (Continued.)
- Lecture 39 - Feedback System Performance Based on the Frequency Response
- Lecture 40 - Feedback System Performance Based on the Frequency Response (Continued.)
- Lecture 41 - Compensator Design Using Frequency Response Plots

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

NPTEL Video Course - Electrical Engineering - Embedded Systems

Subject Co-ordinator - Prof. Santanu Chaudhary

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Embedded Systems
- Lecture 2 - Embedded Hardware
- Lecture 3 - PIC
- Lecture 4 - PIC Peripherals On Chip
- Lecture 5 - ARM Processor
- Lecture 6 - More ARM Instructions
- Lecture 7 - ARM
- Lecture 8 - Digital Signal Processors
- Lecture 9 - More on DSP Processors
- Lecture 10 - System On Chip (SOC)
- Lecture 11 - Memory
- Lecture 12 - Memory Organization
- Lecture 13 - Virtual Memory and Memory Management Unit
- Lecture 14 - Bus Structure
- Lecture 15 - Bus Structure - 2
- Lecture 16 - Bus Structure - 3 Serial Interfaces
- Lecture 17 - Serial Interfaces
- Lecture 18 - Power Aware Architecture
- Lecture 19 - Software for Embedded Systems
- Lecture 20 - Fundamentals of Embedded Operating Systems
- Lecture 21 - Scheduling Policies
- Lecture 22 - Resource Management
- Lecture 23 - Embedded - OS
- Lecture 24 - Networked Embedded Systems - I
- Lecture 25 - Networked Embedded Systems - II
- Lecture 26 - Networked Embedded Systems - III
- Lecture 27 - Networked Embedded Systems - IV
- Lecture 28 - Designing Embedded Systems - I
- Lecture 29 - Designing Embedded Systems - II

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

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- Lecture 30 - Designing Embedded Systems- III
- Lecture 31 - Embedded System Design - IV
- Lecture 32 - Designing Embedded Systems - V
- Lecture 33 - Platform Based Design
- Lecture 34 - Compilers for Embedded Systems
- Lecture 35 - Developing Embedded Systems
- Lecture 36 - Building Dependable Embedded Systems
- Lecture 37 - Pervasive and Ubiquitous Computing

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

NPTEL Video Course - Electrical Engineering - Power System Generation, Transmission and Distribution (Encapsu

Subject Co-ordinator - Prof. D.P. Kothari

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Electric Energy Systems A Perspective
- Lecture 2 - Structure of Power Systems
- Lecture 3 - Conventional Sources of Electric Energy
- Lecture 4 - Hydroelectric Power Generation
- Lecture 5 - Non Conventional Energy Sources
- Lecture 6 - Renewable Energy (Continued.)
- Lecture 7 - Energy Storage
- Lecture 8 - Deregulation
- Lecture 9 - Air Pollutants
- Lecture 10 - Transmission Line Parameters
- Lecture 11 - Capacitance of Transmission Lines
- Lecture 12 - Characteristics and Performance of Transmission Lines
- Lecture 13 - Voltage Regulation (VR)
- Lecture 14 - Power Flow through a Line
- Lecture 15 - Methods of Voltage Control
- Lecture 16 - Compensation of Transmission Lines
- Lecture 17 - Compensation of Transmission Lines (Continued.)
- Lecture 18 - Underground Cables
- Lecture 19 - Cables (Continued.)
- Lecture 20 - Insulators for Overhead Lines
- Lecture 21 - HVDC
- Lecture 22 - HVDC (Continued.)
- Lecture 23 - Distribution Systems
- Lecture 24 - Automatic Generation Control
- Lecture 25 - Automatic Generation Control (Continued.)
- Lecture 26 - Load Flow Studies
- Lecture 27 - Load Flow Problem
- Lecture 28 - Load Flow Analysis (Continued.), Gauss Siedel Method
- Lecture 29 - Newton Raphson (NR), Load Flow Method

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

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- Lecture 30 - Fast Decoupled Load Flow
- Lecture 31 - Control of Voltage Profile
- Lecture 32 - Optimal System Operation (Economic Operation)
- Lecture 33 - Optimal Unit Commitment
- Lecture 34 - Optimal Generation Scheduling
- Lecture 35 - Optimal Load Flow (Continued.) and Hydro Thermal Scheduling

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

NPTEL Video Course - Electrical Engineering - Power System Dynamics

Subject Co-ordinator - Dr. M.L. Kothari

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction to Power System Stability Problem - Part-1
- Lecture 2 - Introduction to Power System Stability Problem - Part-2
- Lecture 3 - Introduction to Power System Stability Problem - Part-3
- Lecture 4 - Solution of Switching Equation
- Lecture 5 - The Equal Area Criterion for Stability - Part-1
- Lecture 6 - The Equal Area Criterion for Stability - Part-2
- Lecture 7 - Transient Stability Analysis of a Multi Machine System
- Lecture 8 - Modeling of Synchronous Machine - Part-1
- Lecture 9 - Modeling of Synchronous Machine - Part-2
- Lecture 10 - Modeling of Synchronous Machine - Part-3
- Lecture 11 - Modeling of Synchronous Machine - Part-4
- Lecture 12 - Synchronous Machine Representation for Stability Studies - Part-1
- Lecture 13 - Synchronous Machine Representation for Stability Studies - Part-2
- Lecture 14 - Excitation Systems - Part-1
- Lecture 15 - Excitation Systems - Part-2
- Lecture 16 - Modeling of Excitation Systems - Part-1
- Lecture 17 - Modeling of Excitation Systems - Part-2
- Lecture 18 - Small Signal Stability of a Single Machine Infinite Bus System - Part-1
- Lecture 19 - Small Signal Stability of a Single Machine Infinite Bus System - Part-2
- Lecture 20 - Small Signal Stability of a Single Machine Infinite Bus System - Part-3
- Lecture 21 - Small Signal Stability of a Single Machine Infinite Bus System - Part-4
- Lecture 22 - Small Signal Stability of a Single Machine Infinite Bus System - Part-5
- Lecture 23 - Dynamic Modeling of Steam turbines and Governors
- Lecture 24 - Dynamic modeling of Hydro Turbines and Governors
- Lecture 25 - Load modeling for Stability Studies
- Lecture 26 - Numerical Integration Methods for Solving a Set of Ordinary Nonlinear Differential Equation
- Lecture 27 - Simulation of Power System Dynamic Response
- Lecture 28 - Dynamic Equivalents for Large Scale Systems - Part-1
- Lecture 29 - Dynamic Equivalents for Large Scale Systems - Part-2

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

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- Lecture 30 - Dynamic Equivalents for Large Scale Systems - Part-3
- Lecture 31 - Direct Method of Transient Stability Analysis - Part-1
- Lecture 32 - Direct Method of Transient Stability Analysis - Part-2
- Lecture 33 - Sub Synchronous Oscillations - Part-1
- Lecture 34 - Sub Synchronous Oscillations - Part-2
- Lecture 35 - Voltage Stability - Part-1
- Lecture 36 - Voltage Stability - Part-2
- Lecture 37 - Voltage Stability - Part-3
- Lecture 38 - Voltage Stability - Part-4
- Lecture 39 - Methods of Improving Stability - Part-1
- Lecture 40 - Methods of Improving Stability - Part-2

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

NPTEL Video Course - Electrical Engineering - Analog Electronic Circuits

Subject Co-ordinator - Prof. S.C. Dutta Roy

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Review of DC Models of Diodes & BJT's
- Lecture 2 - Review of DC Models of BJT (Continued...) and FET
- Lecture 3 - FET Characteristics and Models
- Lecture 4 - Problem Session-1 on DC Analysis of BJT Circuits
- Lecture 5 - BJT Biasing and Bias Stability
- Lecture 6 - BJT Bias Stability (Continued...)
- Lecture 7 - FET Biasing, Current Sources
- Lecture 8 - Problem Session-2 on FET and BJT Characteristics and Biasing
- Lecture 9 - Current Mirrors; BJT Small Signal Models
- Lecture 10 - Small Signal Amplifiers
- Lecture 11 - Mid Frequency Analysis of the CE and CB Amplifier
- Lecture 12 - Problem Session-3 on Mid- Frequency Analysis of CE Amplifiers
- Lecture 13 - Midband Analysis of CB and CC Amplifiers
- Lecture 14 - Midband Analysis of FET Amplifiers
- Lecture 15 - Problem Session-4 on Midband Analysis of Amplifiers
- Lecture 16 - High Frequency Response of Small Signal Amplifiers
- Lecture 17 - High Frequency Response of Small Signal Amplifiers (Continued...)
- Lecture 18 - Low Frequency Response of Small Signal Amplifiers
- Lecture 19 - Problem Session-5 on Frequency Response of Small Signal Amplifiers
- Lecture 20 - Differential Amplifiers
- Lecture 21 - Differential Amplifiers (Continued...)
- Lecture 22 - Discussion on Minor-1 Problems and Differential Amplifiers (Continued...)
- Lecture 23 - Problem Session-6 on Frequency Response of Small Signal Amplifiers (Continued...) and Differential Amplifiers
- Lecture 24 - Use of Current Mirrors in Differential Amplifiers
- Lecture 25 - FET Differential Amplifiers and Introduction to Power Amplifiers
- Lecture 26 - Class B, Class AB and Class A Power Amplifiers
- Lecture 27 - Class A Power Amplifiers; Efficiency Considerations
- Lecture 28 - Problem Session-7 on Differential and Power Amplifiers
- Lecture 29 - Introduction to Feedback Amplifiers

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

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- Lecture 30 - Advantages of Negative Feedback Amplifiers
- Lecture 31 - Analysis of Feedback Amplifiers
- Lecture 32 - Analysis of the Series - Series and Other Feedback Configurations
- Lecture 33 - Problem Session-8 on Feedback Amplifiers
- Lecture 34 - Sinusoidal Oscillators
- Lecture 35 - More on Oscillators
- Lecture 36 - Solutions to Minor-2 Exam and Concluding Discussions on Oscillators
- Lecture 37 - Problem Session-9 on Oscillators
- Lecture 38 - Tuned (or Narrowband) Amplifiers
- Lecture 39 - Widebanding Techniques
- Lecture 40 - Widebanding By Using an Inductance
- Lecture 41 - Problem Session-10 on Tuned Amplifiers
- Lecture 42 - Widebanding by Using Compound Devices
- Lecture 43 - Cascode Configuration as Wideband Amplifier
- Lecture 44 - Widebanding by Local Feedback
- Lecture 45 - Problem Session-11 on Minor-3 Problems & Widebanding by Compound Devices
- Lecture 46 - Widebanding by Local Feedback and Feedback Cascades
- Lecture 47 - Widebanding by Overall Feedback and Dual Loop Feedback
- Lecture 48 - The Differential Pair and the Gilbert Cell as Wideband Amplifiers
- Lecture 49 - Correction to Gilbert Cell Analysis and Operational Amplifier Imperfections
- Lecture 50 - Op-Amp offsets, Compensation and Slew Rate
- Lecture 51 - Op-Amp Compensation, Slew Rate and Some Problems

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

NPTEL Video Course - Electrical Engineering - Digital Communication

Subject Co-ordinator - Prof. Surendra Prasad

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction to the Course
- Lecture 2 - Digital Representation of Analog Signals, Delta Modulation
- Lecture 3 - Digital Representation of Analog Signals, Pulse Code Modulation
- Lecture 4 - Digital Representation of Analog Signals
- Lecture 5 - Quantization Noise in Delta Modulation (Continued...) and Time Division Multiplexing
- Lecture 6 - Introduction to Line Coding
- Lecture 7 - Spectral Properties of Line Codes
- Lecture 8 - Spectral Properties of Line Codes
- Lecture 9 - Spectral Properties of Line Codes
- Lecture 10 - Baseband Pulse Shaping
- Lecture 11 - Baseband Pulse Shaping; Raised Cosine Family of Pulses
- Lecture 12 - Partial Response Signalling
- Lecture 13 - Precoding for Duobinary and Modified Duobinary Systems
- Lecture 14 - Precoding for Modified Duobinary Systems (Continued...) and General Partial Response Signalling
- Lecture 15 - Binary Baseband Digital Modulation Techniques
- Lecture 16 - Mâ ary Baseband Digital Modulation Techniques
- Lecture 17 - Passband Digital Modulations - I
- Lecture 18 - Passband Digital Modulations - II
- Lecture 19 - Passband Digital Modulations - III
- Lecture 20 - Passband Digital Modulations - IV
- Lecture 21 - Passband Modulations for Band Limited Channels
- Lecture 22 - Baseband and Passband Digital Demodulations
- Lecture 23 - Digital Modulation Part - II Matched Filters
- Lecture 24 - Matched Filters and Coherent Demodulation-I
- Lecture 25 - Coherent Demodulation for Binary Wave Form
- Lecture 26 - Demodulators for Binary Waveforms (Continued...)
- Lecture 27 - Performance Analysis of Binary Digital Modulations
- Lecture 28 - Error Rates for Binary Signalling
- Lecture 29 - Performance of Non Coherent FSK and Differential Phase Shift Keying

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

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- Lecture 30 - Demodulation of DPSK and M<sup>ary</sup> Signals
- Lecture 31 - Performance of M<sup>ary</sup> Digital Modulations
- Lecture 32 - Performance of M<sup>ary</sup> Digital Modulations (Continued...)
- Lecture 33 - Introduction to Information Theory, Part-1
- Lecture 34 - Source Coding
- Lecture 35 - Error Free Communication Over a Noisy Channel
- Lecture 36 - The Concept of Channel Capacity
- Lecture 37 - Error Correcting Codes
- Lecture 38 - Error Correcting Codes (Continued...)

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

NPTEL Video Course - Electrical Engineering - Introduction To Electronic Circuits

Subject Co-ordinator - Prof. S.C. Dutta Roy

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction to the Course and Basic Electrical Quantity
- Lecture 2 - R.L.C. Components, Energy Considerations, Sources and Circuit Laws
- Lecture 3 - KCL, KVL and Network Analysis
- Lecture 4 - Networks Theorems ( Thevenin's Norton's )
- Lecture 5 - Source Transformation; Super Position Theorem and Non-Linear One-Ports
- Lecture 6 - Signal Wave Forms
- Lecture 7 - Periodic Wave Forms and Elements of Amplifiers
- Lecture 8 - Operational Amplifiers and Diodes
- Lecture 9 - Rectifiers and Power Supplies
- Lecture 10 - Wave Shaping Circuits
- Lecture 11 - More on Wave Shaping Circuits and Introduction to Natural Response of Circuits
- Lecture 12 - Natural Response (Continued...)
- Lecture 13 - Natural Response of 2nd Order Circuit
- Lecture 14 - Natural Response of 2nd Order Circuit (Continued...)
- Lecture 15 - Impedance Functions, Poles, Zeros and their Applications
- Lecture 16 - Natural Response and Poles and Zeros and Introduction to Forced Response
- Lecture 17 - Phasors and their Applications in AC Ckts, analysis
- Lecture 18 - More About Phasors and Introduction to Complete Response
- Lecture 19 - Complete Response of Electrical Circuits
- Lecture 20 - AC Circuit Analysis
- Lecture 21 - Filter Circuits and Resonance
- Lecture 22 - Resonance (Continued...)
- Lecture 23 - General Network Analysis
- Lecture 24 - Two-Port Networks
- Lecture 25 - Semiconductor Physics
- Lecture 26 - Semiconductor Physics (Continued...)
- Lecture 27 - More About Diodes Including Zener Diodes
- Lecture 28 - Bipolar Junction Transistors
- Lecture 29 - Transistors Characteristics and Biasing

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

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- Lecture 30 - BJT Biasing and Introduction to Power Amplifiers
- Lecture 31 - BJT Power Amplifiers
- Lecture 32 - Power Amplifier
- Lecture 33 - Power Amplifiers (Continued...) and an Introduction to Small Signal Modelling of BJT
- Lecture 34 - Small Signal Model and Small Signal Amplifiers
- Lecture 35 - Small Signal Amplifiers (Continued...)
- Lecture 36 - Small Signal Amplifier (Continued...)
- Lecture 37 - Small Signal Amplifiers (Continued...)
- Lecture 38 - Negative Feedback
- Lecture 39 - Digital Circuits
- Lecture 40 - Digital Circuits (Continued...)

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

NPTEL Video Course - Electrical Engineering - NOC:Analog Electronic Circuit

Subject Co-ordinator - Dr. Shouribrata Chatterjee

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction to Analog Circuits Introduction to the Diode
- Lecture 2 - Diodes, Introduction to The Transistor
- Lecture 3 - MOS Device, Characteristics
- Lecture 4 - DC operating point
- Lecture 5 - DC operating point, amplifier design
- Lecture 6 - Common source amplifier, small signal analysis
- Lecture 7 - Common gate, common drain
- Lecture 8 - Common gate circuit
- Lecture 9 - Source degenerated amplifier
- Lecture 10 - Swing limits
- Lecture 11 - Swing limits (Continued...), multi transistor amplifiers
- Lecture 12 - Multi-transistor amplifiers
- Lecture 13 - Introduction to current sources
- Lecture 14 - Current sources/mirrors (Continued...)
- Lecture 15 - Current sources, biasing
- Lecture 16 - Differential circuits
- Lecture 17 - Differential amplifiers-I
- Lecture 18 - Differential amplifiers-II
- Lecture 19 - Differential amplifiers-III
- Lecture 20 - Self biased active load diff. amp
- Lecture 21 - Diff. Cascode amplifier, two stage amplifiers
- Lecture 22 - Two stage diff. amps, op-amps
- Lecture 23 - Op-amps, OTAs
- Lecture 24 - Circuits with op-amps
- Lecture 25 - Capacitance in MOS devices
- Lecture 26 - Common source, drain, gate-revisited
- Lecture 27 - Common gate, common drain with capacitances
- Lecture 28 - Cascode, cascade-revisit with capacitance
- Lecture 29 - Cascade amplifier (with capacitance)

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

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- Lecture 30 - Diversion
- Lecture 31 - Diversion Continued
- Lecture 32 - Compensation
- Lecture 33 - Op-amp Design with Compensation
- Lecture 34 - Unity Gain Bandwidth
- Lecture 35 - Power Amplification
- Lecture 36 - Power Amplifiers-2
- Lecture 37 - Power Amplifiers- Class A,B,AB,C ClassD
- Lecture 38 - Class D Amplifiers, Push-pull Amplifiers
- Lecture 39 - Introduction to Voltage Regulators
- Lecture 40 - Voltage Regulators- line, load; Conclusion Regulation

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

NPTEL Video Course - Electrical Engineering - NOC:Nonlinear and Adaptive Control

Subject Co-ordinator - Prof. Shubhendu Bhasin

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Introduction

Lecture 2 - Preliminaries

Lecture 3 - Model Reference Adaptive Control - Part 1

Lecture 4 - Model Reference Adaptive Control - Part 2

Lecture 5 - Model Reference Adaptive Control - Part 3

Lecture 6 - Adaptive Command Tracking

Lecture 7 - Robust Model Reference Adaptive Control - Part 1

Lecture 8 - Robust Model Reference Adaptive Control - Part 2

Lecture 9 - Robust Model Reference Adaptive Control - Part 3

Lecture 10 - Robust Model Reference Adaptive Control - Part 4

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

NPTEL Video Course - Electrical Engineering - NOC:Information Theory, Coding and Cryptography

Subject Co-ordinator - Prof. Ranjan Bose

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction to Information Theory
- Lecture 2 - Entropy, Mutual Information, Conditional and Joint Entropy
- Lecture 3 - Measures for Continuous, Random Variable, Relative Entropy
- Lecture 4 - Variable Length Codes, Prefix Codes
- Lecture 5 - Source Coding Theorem
- Lecture 6 - various source coding Techniques
- Lecture 7 - Optimum Quantizer, Practical Application of Source Coding
- Lecture 8 - Introduction to Super Information
- Lecture 9 - Channel Models and Channel Capacity
- Lecture 10 - Noisy Channel Coding Theorem
- Lecture 11 - Gaussian Channel and Information Capacity Theorem
- Lecture 12 - Capacity of MIMO Channels
- Lecture 13 - Introduction to Error Control Coding
- Lecture 14 - Introduction to Galois Field
- Lecture 15 - Equivalent Codes, Generator Matrix and Parity Check Matrix
- Lecture 16 - Systematic Codes, Error Detections and Correction
- Lecture 17 - Erasure and Errors, Standard Array and Syndrome Decoding
- Lecture 18 - Probability of Error, Coding Gain and Hamming Bound
- Lecture 19 - Hamming Codes, LDPC Codes and MDS Codes
- Lecture 20 - Introduction to Cyclic Codes
- Lecture 21 - Generator Polynomial, Syndrome Polynomial and Matrix Representation
- Lecture 22 - Fire Code, Golay Code, CRC Codes and Circuit Implementation of Cyclic Codes
- Lecture 23 - Introduction to BCH Codes
- Lecture 24 - Multiple Error Correcting BCH Codes, Decoding of BCH Codes
- Lecture 25 - Introduction to Reed Solomon (RS) Codes
- Lecture 26 - Introduction to Convolutional Codes
- Lecture 27 - Trellis Codes
- Lecture 28 - Vitrebi Decoding and Known good Convolutional Codes
- Lecture 29 - Introduction to Turbo Codes

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

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- Lecture 30 - Introduction to Trellis Coded Modulation (TCM)
- Lecture 31 - Ungerboeck's Design Rules and Performance Evaluation of TCM Schemes
- Lecture 32 - TCM for Fading Channel and Space Time Trellis Codes (STTC)
- Lecture 33 - Introduction to Space Time Block Codes (STBC)
- Lecture 34 - Space Time Codes
- Lecture 35 - Space Time Codes (Continued...)
- Lecture 36 - Introduction to Cryptography
- Lecture 37 - Some Well-Known Algorithms
- Lecture 38 - Introduction to Physical Layer Security
- Lecture 39 - Secrecy Outage Capacity, Secrecy Outage Probability, Cooperative Jamming

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

NPTEL Video Course - Electrical Engineering - Engineering Electromagnetics

Subject Co-ordinator - Prof. Sheel Aditya

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Introduction

Lecture 2 - Transmission Lines

Lecture 3 - Transmission Lines

Lecture 4 - Transmission Lines

Lecture 5 - Transmission Lines

Lecture 6 - Transmission Lines

Lecture 7 - Transmission Lines

Lecture 8 - Transmission Lines

Lecture 9 - Transmission Lines

Lecture 10 - Transmission Lines

Lecture 11 - Transmission Lines

Lecture 12 - Wave Propagation

Lecture 13 - Wave Propagation (Continued...)

Lecture 14 - Wave Propagation

Lecture 15 - Wave Propagation

Lecture 16 - Wave Propagation

Lecture 17 - Wave Propagation

Lecture 18 - Reflection and Refraction of waves

Lecture 19 - Reflection and Refraction of waves (Continued...)

Lecture 20 - Reflection and Refraction of waves (Continued...) - 1

Lecture 21 - Reflection and Refraction of waves (Continued...); The Plane slab

Lecture 22 - Reflection and Refraction of waves (Continued...); Transmission Line Analogy for Planes Waves

Lecture 23 - Wave Guides

Lecture 24 - Wave Guides (Continued...) Parallel plane Guide, Transverse Electric Waves, Field Distribution, Sup

Lecture 25 - Wave Guides (Continued...)

Lecture 26 - Wave Guides (Continued...) Parallel plane Guide, Characteristics of TE and Tm Waves, TEM Waves, Wav

Lecture 27 - Wave Guides (Continued...) - 1

Lecture 28 - Wave Guides (Continued...) - 2

Lecture 29 - Wave Guides (Continued...) Rectangular Wave Guides

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

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- Lecture 30 - Wave Guides (Continued...)
- Lecture 31 - Wave Guides (Continued...) Rectangular Wave Guides - 1
- Lecture 32 - Resonators General Properties
- Lecture 33 - Resonators (Continued...) Transmission Line Resonators
- Lecture 34 - Resonators (Continued...) Wave Guide Resonators
- Lecture 35 - Radiation
- Lecture 36 - Radiation (Continued...)
- Lecture 37 - Radiation (Continued...) - 1
- Lecture 38 - Radiation (Continued...) - 2
- Lecture 39 - Radiation (Continued...) Monopole Antennas half Wave Dipole Antenna
- Lecture 40 - Radiation (Continued...)
- Lecture 41 - Radiation (Continued...) 2 - Element Arrays, Yagi-Uda Array



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

NPTEL Video Course - Electrical Engineering - NOC:Principles of Digital Communications (2018)

Subject Co-ordinator - Prof. Abhishek Dixit

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Introduction  
Lecture 2 - Signal Spaces  
Lecture 3 - Inner Product and Orthogonal Expansion  
Lecture 4 - Signal Spaces  
Lecture 5 - Signal Spaces  
Lecture 6 - Signal Spaces  
Lecture 7 - Random Variables and Random Processes  
Lecture 8 - Random Variables and Random Processes  
Lecture 9 - Random Variables and Random Processes  
Lecture 10 - Random Variables and Random Processes  
Lecture 11 - Random Variables and Random Processes  
Lecture 12 - Random Variables and Random Processes  
Lecture 13 - Random Variables and Random Processes  
Lecture 14 - Random Variables and Random Processes  
Lecture 15 - Random Variables and Random Processes  
Lecture 16 - Random Variables and Random Processes  
Lecture 17 - Random Variables and Random Processes  
Lecture 18 - Waveform Coding  
Lecture 19 - Modulation  
Lecture 20 - Modulation  
Lecture 21 - Modulation  
Lecture 22 - Modulation  
Lecture 23 - Modulation  
Lecture 24 - Modulation  
Lecture 25 - Modulation  
Lecture 26 - Modulation  
Lecture 27 - Modulation  
Lecture 28 - Modulation  
Lecture 29 - Modulation

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

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Lecture 30 - Detection  
Lecture 31 - Detection  
Lecture 32 - Detection  
Lecture 33 - Detection  
Lecture 34 - Detection  
Lecture 35 - Detection  
Lecture 36 - Detection  
Lecture 37 - Detection  
Lecture 38 - Detection

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

NPTEL Video Course - Electrical Engineering - NOC:Electric Vehicles - Part 1

Subject Co-ordinator - Prof. Amit Jain

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction - EV Historical Background
- Lecture 2 - Introduction - EV Benefits of Using EVs
- Lecture 3 - Introduction - EV Overview of types of EVs and its Challenges
- Lecture 4 - Introduction - EV Motor Drive Technologies
- Lecture 5 - Introduction - EV Energy Source Technologies
- Lecture 6 - Introduction - EV Battery Charging Technologies
- Lecture 7 - Introduction - EV Vehicle to Grid
- Lecture 8 - Introduction - EV Subsystems and Configurations
- Lecture 9 - Introduction - HEV Subsystems and Configurations
- Lecture 10 - Introduction - HEV Subsystems and Modes of Operation
- Lecture 11 - Vehicle Dynamics Introduction and tractive effort
- Lecture 12 - Vehicle Dynamics and dynamic equation
- Lecture 13 - Vehicle Dynamics simulation dynamic equation constant Fte
- Lecture 14 - Vehicle Dynamics dynamic equation variable Fte
- Lecture 15 - Vehicle Dynamics simulation dynamic equation variable Fte
- Lecture 16 - Vehicle Dynamics Modelling and simulation in Simulink
- Lecture 17 - Summary Electric Vehicles Part 1 Course
- Lecture 18 - Basics of DC Motor Drive
- Lecture 19 - Realization of DC Chopper
- Lecture 20 - Open Loop Operation of Chopper Fed DC Motor Drive
- Lecture 21 - Review of Control Theory
- Lecture 22 - Modeling and Current Controller Design for Separately Excited DC Motor Drive
- Lecture 23 - Speed Controller Design and Performance Evaluation of DC Motor Drive
- Lecture 24 - Fundamentals of Three Phase Induction Motor
- Lecture 25 - Equivalent Circuit and Torque-Speed Characteristics of Induction Motor
- Lecture 26 - Starting and Speed Control of Induction Motor
- Lecture 27 - Realisation of DC to AC Power Converter
- Lecture 28 - Impact of Non-Sinusoidal Voltage on Induction Motor
- Lecture 29 - Selective Harmonic Elimination and Optimal Pulse Width Modulation Techniques

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

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- Lecture 30 - Switching Energy Losses and Sine-Triangle PWM
- Lecture 31 - Analysis of Sine-Triangle PWM
- Lecture 32 - Simulation Studies on Open Loop Induction Motor Drive

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

NPTEL Video Course - Electrical Engineering - NOC:Power Electronics

Subject Co-ordinator - Prof. G.Bhuvaneshwari

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction to Power Electronics
- Lecture 2 - Power Devices
- Lecture 3 - Power Devices
- Lecture 4 - Power Devices
- Lecture 5 - Single-phase Uncontrolled Rectifiers
- Lecture 6 - Single-phase Controlled Rectifiers - I
- Lecture 7 - Single-phase Controlled Rectifiers - II
- Lecture 8 - Three Phase Rectifiers - I
- Lecture 9 - Numericals on devices and Single-phase Rectifiers
- Lecture 10 - Three Phase Rectifiers - II
- Lecture 11 - Dual Converter and Communication Overlap
- Lecture 12 - Communication Overlap - II and AC-AC Converter-Introduction
- Lecture 13 - Single-Phase and Three-Phase AC Voltage Controllers
- Lecture 14 - Three-Phase AC Voltage Controllers and Cycloconverters
- Lecture 15 - Non-Isolated DC-DC Converters - I
- Lecture 16 - Non-Isolated DC-DC Converters - II
- Lecture 17 - Isolated DC-DC Converters - I
- Lecture 18 - Isolated DC-DC Converters - II and Cuk Converters
- Lecture 19 - Voltage Source Inverters
- Lecture 20 - VSI PWM Techniques - I
- Lecture 21 - VSI PWM Techniques - II
- Lecture 22 - SPWM and SVM Technique
- Lecture 23 - Current Source Inverter
- Lecture 24 - Power Electronics Applications

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

NPTEL Video Course - Electrical Engineering - NOC:Electrical Machines

Subject Co-ordinator - Prof. G.Bhuvaneshwari

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction to Electrical Machines - I
- Lecture 2 - Single-phase and Three-phase AC Circuits, Magnetic circuits
- Lecture 3 - Magnetic Circuit - II
- Lecture 4 - Magnetic Circuit - III
- Lecture 5 - Transformers - Introduction
- Lecture 6 - Transformers - Amp-Turn Balance, Ideal and practical transformers
- Lecture 7 - Transformer Equivalent circuit and Reducing leakage
- Lecture 8 - Transformer equivalent circuit parameter determination
- Lecture 9 - Transformers - Voltage regulation and efficiency
- Lecture 10 - Auto-transformers
- Lecture 11 - PU notation and Introduction to Instrument transformers
- Lecture 12 - Instrument Transformers and All Day Efficiency
- Lecture 13 - Three Phase Transformers - I
- Lecture 14 - Three Phase Transformers - II
- Lecture 15 - Electromechanical Energy Conversion - I
- Lecture 16 - Electromechanical Energy Conversion - II
- Lecture 17 - Electromechanical Energy Conversion - III
- Lecture 18 - DC Machines-Introduction, Constructional Features
- Lecture 19 - DC Machines - EMF and Torque Equations and Generator Operation
- Lecture 20 - DC Machines - OCC and Load Characteristics Classification
- Lecture 21 - DC Machines - Armature Reaction
- Lecture 22 - DC Machines - Voltage Build-up and Load Characteristics
- Lecture 23 - DC Generator Characteristics and Introduction to DC Motors
- Lecture 24 - DC Motors
- Lecture 25 - DC Motor
- Lecture 26 - DC Motor
- Lecture 27 - DC Machine
- Lecture 28 - DC Machine
- Lecture 29 - 3 Phase Induction Machine

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

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- Lecture 30 - 3 Phase Induction Machine
- Lecture 31 - 3 Phase Induction Machine
- Lecture 32 - Testing of Induction Motor
- Lecture 33 - 3 Phase Induction Machine
- Lecture 34 - Synchronous Machines
- Lecture 35 - Synchronous Machines
- Lecture 36 - Numerical Session
- Lecture 37 - Synchronization of Alternators
- Lecture 38 - Synchronous Machines
- Lecture 39 - Synchronous Machines
- Lecture 40 - Synchronous Machines
- Lecture 41 - Single Phase Induction Motors

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

NPTEL Video Course - Electrical Engineering - Special Electromechanical Systems

Subject Co-ordinator - Prof. S.S. Murthy

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Special Electromechanical Systems (Introduction)

Lecture 2 - Classification of Machines

Lecture 3 - Single and Two-Phase Motors

Lecture 4 - Single-Phase Induction Motors-Analysis

Lecture 5 - Starting of Single-Phase Induction Motors

Lecture 6 - Single-Phase Induction Motors Analysis

Lecture 7 - Induction Motors Analysis by Symmetrical Components

Lecture 8 - Modelling of 1-Phase Induction Motor (One and Two Windings)

Lecture 9 - Asymmetrical Induction Motor Generalized Rotating Field Theory

Lecture 10 - Generalized Rotating Field Theory (Continued...)

Lecture 11 - Generalized Rotating Field Theory (Continued...)

Lecture 12 - Generalized Rotating Field Theory (Continued...)

Lecture 13 - Analysis of Asymmetrical Machine by Generalized Rotating Field Theory

Lecture 14 - Analysis of Asymmetrical Machine

Lecture 15 - Analysis of Asymmetrical Induction Machine

Lecture 16 - Generalised Rotating-Field Theory of Wound Rotor Ind. Machine Having Asymmetry in Stator and Rotor

Lecture 17 - Generalised Rotating-Field Theory of Wound Rotor Ind. Machine Having Asymmetry in Stator and Rotor

Lecture 18 - Testing of Small Electrical Machines

Lecture 19 - Testing of 1-Phase Induction Motors

Lecture 20 - Variable Reluctance (VR) Motors

Lecture 21 - Switched Reluctance Motor (Continued...)

Lecture 22 - Switched Reluctance Motor (Continued...)

Lecture 23 - Switched Reluctance Motor (Continued...)

Lecture 24 - Stepper Motors

Lecture 25 - Stepper Motors (Continued...)

Lecture 26 - Induction Generators

Lecture 27 - Induction Generators (Continued...)

Lecture 28 - Doubly Fed Induction Generators

Lecture 29 - Self Excited Induction Generators

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

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- Lecture 30 - Self Excited Induction Generators (Continued...)
- Lecture 31 - Permanent Magnet Machines
- Lecture 32 - Squarewave Permanent Magnet Brushless Motor Drive
- Lecture 33 - Sine Wave Permanent Magnet Brushless Motor Drives
- Lecture 34 - Permanent Magnet Synchronous Motors

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

NPTEL Video Course - Electrical Engineering - NOC:High Power Multilevel Converters - Analysis, Design and Operation

Subject Co-ordinator - Prof. Anand Rup

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Basic Understanding of Converter (Introduction to Power Converters)
- Lecture 2 - Basic Understanding of Converter (Half Bridge and Full Bridge Circuit Operation)
- Lecture 3 - Basic Understanding of Converter (Sinusoidal Pulse width Modulation and Three Phase Circuit)
- Lecture 4 - Basic Understanding of Converter (Harmonics in Sinusoidal PWM)
- Lecture 5 - Third harmonic addition in Sine PWM
- Lecture 6 - Introduction to Space Vectors
- Lecture 7 - Space Vector PWM - Timing Calculation
- Lecture 8 - Space Vector PWM - Switching Sequence
- Lecture 9 - Space Vector PWM - Using Carriers
- Lecture 10 - Basic Introduction to Power Devices
- Lecture 11 - Introduction to Multilevel Converters
- Lecture 12 - Cascaded H-bridge Multilevel Converters
- Lecture 13 - Output Voltage Waveform Synthesis in CHB Converter and Basic of Asymmetrical CHB Converters
- Lecture 14 - Cascaded H-Bridge Converters
- Lecture 15 - Cascaded H-Bridge Converters
- Lecture 16 - Fault Tolerant Operation of Cascaded H-Bridge Converter - Part I
- Lecture 17 - Fault Tolerant Operation of Cascaded H-Bridge Converter - Part II
- Lecture 18 - Modular Multilevel Converter - Topology and Operation
- Lecture 19 - Modular Multilevel Converter - Arm and Cell Voltage Ratings
- Lecture 20 - Modular Multilevel Converter - Arm Currents
- Lecture 21 - Modular Multilevel Converter - Arm Energy Balancing
- Lecture 22 - Modular Multilevel Converter - Different Circuit Topologies
- Lecture 23 - Modular Multilevel Converter - PWM Technique and Capacitor Voltage Balancing
- Lecture 24 - Modular Multilevel Converter - Fault Tolerant Operation and Commercial Production
- Lecture 25 - Design of Components in MMC
- Lecture 26 - Neutral Point Clamped Converter - Circuit Topology - Part I
- Lecture 27 - Neutral Point Clamped Converter - Circuit Topology - Part II
- Lecture 28 - Neutral Point Clamped Converter - Space Vector Diagram
- Lecture 29 - Neutral Point Clamped Converter - Space Vector PWM

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

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- Lecture 30 - NPC - Sinusoidal PWM and Space Vector PWM using Single Carrier Strategy
- Lecture 31 - Neutral Point Clamped Converter - Mid-point Voltage Fluctuations
- Lecture 32 - Neutral Point Clamped Converter - Capacitor Voltage Balancing
- Lecture 33 - Neutral Point Clamped Converter - Another Strategy of Capacitor Voltage Balancing
- Lecture 34 - Other Topologies of NPC Converters - Higher Level NPC, TNPC and Active NPC
- Lecture 35 - Multipulse Transformer - Part I
- Lecture 36 - Multipulse Transformer - Part II
- Lecture 37 - A Case Study on MMC and CHB
- Lecture 38 - Basics of Gate Driver Circuits
- Lecture 39 - Gate Driver Circuits - Turn-on and Turn-off Process
- Lecture 40 - Gate Driver Circuits - Features of Gate Drivers and Basics of Bootstrap Functionality
- Lecture 41 - Condition Monitoring of Converters
- Lecture 42 - Other Converter Topologies
- Lecture 43 - Summary of the Course

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

NPTEL Video Course - Electrical Engineering - NOC:Introduction to Embedded System Design

Subject Co-ordinator - Prof. Badri N Subudhi, Prof.Dhananjay V. Gadre

Co-ordinating Institute - IIT - Jammu

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

- Lecture 1 - Introduction
- Lecture 2 - Introduction continued with Project demos
- Lecture 3 - Modular Approach to ESD
- Lecture 4 - Modular Approach to ESD (Continued...)
- Lecture 5 - Salient Features of Modern Microcontrollers
- Lecture 6 - Salient Features of Modern Microcontrollers (Continued...)
- Lecture 7 - Elements of Microcontroller Ecosystem
- Lecture 8 - Elements of Microcontroller Ecosystem (Continued...)
- Lecture 9 - Power Supply for Embedded Systems
- Lecture 10 - Power Supply for Embedded Systems (Continued...)
- Lecture 11 - Introduction to MSP430
- Lecture 12 - MSP430 Architecture
- Lecture 13 - MSP430 Architecture- (Continued...) And Introduction to Lunchbox
- Lecture 14 - Programming Methods for MSP430
- Lecture 15 - Physical Interfacing - 1
- Lecture 16 - Physical Interfacing - 2
- Lecture 17 - Physical Interfacing - 3
- Lecture 18 - Physical Interfacing - 4
- Lecture 19 - Physical Interfacing - 5
- Lecture 20 - Physical Interfacing - 6
- Lecture 21 - GIT, CCS Installation and Embedded C
- Lecture 22 - MSP430 Digital I/O
- Lecture 23 - MSP430 Digital I/O
- Lecture 24 - MSP430 Clock System and Reset
- Lecture 25 - Interrupts in MSP430
- Lecture 26 - Interrupts in MSP430 (Continued...)
- Lecture 27 - Interfacing Seven Segment Displays with MSP430; Low Power Modes in MSP430
- Lecture 28 - Interfacing Liquid Crystal Displays (LCD)
- Lecture 29 - MSP430 Timer Module

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

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- Lecture 30 - Pulse Width Modulation, PWM using Timer Capture
- Lecture 31 - Analog to Digital Converter in the MSP430
- Lecture 32 - ADC and DAC using R2R Ladder and Random number generation using LFSR
- Lecture 33 - Serial Communication Protocols, USCI Module in MSP430
- Lecture 34 - MSP430 Timer in Capture Mode
- Lecture 35 - Coding Ninja
- Lecture 36 - Building an Electronics Project
- Lecture 37 - Circuit Prototyping Techniques
- Lecture 38 - Single Purpose Computers
- Lecture 39 - Single Purpose Computers (Continued...)
- Lecture 40 - Recap of Course Coverage and Project Demonstration from Concept to Final

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

NPTEL Video Course - Electrical Engineering - NOC:Power Quality

Subject Co-ordinator - Prof. Bhim Singh

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Power Quality - An Introduction
- Lecture 2 - Power Quality Standards and Monitoring
- Lecture 3 - Power Quality Standards and Monitoring (Continued...)
- Lecture 4 - Passive Shunt and Series Compensations
- Lecture 5 - Passive Shunt and Series Compensations (Continued...)
- Lecture 6 - Passive Shunt and Series Compensations (Continued...)
- Lecture 7 - Active Shunt Compensation
- Lecture 8 - Active Shunt Compensation (Continued...)
- Lecture 9 - Active Shunt Compensation (Continued...)
- Lecture 10 - Active Series Compensation
- Lecture 11 - Active Series Compensation (Continued...)
- Lecture 12 - Unified Power Quality Compensators
- Lecture 13 - Unified Power Quality Compensators (Continued...)
- Lecture 14 - Unified Power Quality Compensators (Continued...)
- Lecture 15 - Loads Which Cause Power Quality Problems
- Lecture 16 - Loads Which Cause Power Quality Problems (Continued...)
- Lecture 17 - Passive Power Filters
- Lecture 18 - Passive Power Filters (Continued...)
- Lecture 19 - Passive Power Filters (Continued...)
- Lecture 20 - Shunt Active Power Filters
- Lecture 21 - Shunt Active Power Filters (Continued...)
- Lecture 22 - Shunt Active Power Filters (Continued...)
- Lecture 23 - Active Series Power Filters
- Lecture 24 - Active Series Power Filters (Continued...)
- Lecture 25 - Active Series Power Filters (Continued...)
- Lecture 26 - Hybrid Power Filters
- Lecture 27 - Hybrid Power Filters (Continued...)
- Lecture 28 - Hybrid Power Filters (Continued...)
- Lecture 29 - AC-DC Converters That Cause Power Quality

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

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- Lecture 30 - Improved Power Quality Converters - AC-DC Boost Converters
- Lecture 31 - Improved Power Quality Converters - AC-DC Boost Converters (Continued...)
- Lecture 32 - Improved Power Quality Converters - AC-DC Buck Converters
- Lecture 33 - Improved Power Quality Converters - AC-DC Buck-Boost Converters
- Lecture 34 - Improved Power Quality Converters - AC-DC Buck-Boost Converters (Continued...)
- Lecture 35 - Improved Power Quality Converters - AC-DC Buck-Boost Converters (Continued...)
- Lecture 36 - Three Phase AC-DC Improved Power Quality Converters
- Lecture 37 - Multipulse Converters
- Lecture 38 - Multipulse Converters (Continued...)
- Lecture 39 - Multipulse Converters (Continued...)
- Lecture 40 - Power Quality Improvement in Solar Energy Conversion System
- Lecture 41 - Power Quality Improvement in Solar Energy Conversion System (Continued...)
- Lecture 42 - Power Quality Improvement in Wind Energy Conversion System
- Lecture 43 - Power Quality Improvement in Diesel Generator Set Based Power Supply System
- Lecture 44 - Power Quality Improvement in Diesel Generator Set Based Power Supply System (Continued...)
- Lecture 45 - Power Quality Improvement in Distributed Generation Sources Based Microgrids

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

NPTEL Video Course - Electrical Engineering - NOC:Introduction to Electrical Engineering

Subject Co-ordinator - Prof. Bhim Singh

Co-ordinating Institute - IIT - Delhi

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

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

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

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Lecture 30  
Lecture 31  
Lecture 32  
Lecture 33  
Lecture 34  
Lecture 35  
Lecture 36  
Lecture 37  
Lecture 38  
Lecture 39  
Lecture 40  
Lecture 41  
Lecture 42

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

NPTEL Video Course - Electrical Engineering - NOC:Transducers for Instrumentation

Subject Co-ordinator - Ankur Gupta

Co-ordinating Institute - IIT - Delhi

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

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

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

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Lecture 30  
Lecture 31  
Lecture 32  
Lecture 33  
Lecture 34  
Lecture 35  
Lecture 36

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

NPTEL Video Course - Electrical Engineering - NOC:Computer-Aided Design of Electrical Machines

Subject Co-ordinator - Prof. Bhim Singh

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Course Outline and Introduction  
Lecture 2 - Fundamental - I  
Lecture 3 - Equivalent Circuit Approach to Design  
Lecture 4 - Transformer Design - I  
Lecture 5 - Transformer Design - II  
Lecture 6 - Transformer Design - III  
Lecture 7 - Transformer Design - IV  
Lecture 8 - Windings in Electrical Machines  
Lecture 9 - Design of DC Machine - I  
Lecture 10 - Design of DC Machine - II  
Lecture 11 - Design of DC Machine - III  
Lecture 12 - Design of Three-Phase Induction Motors - I  
Lecture 13 - Design of Three-Phase Induction Motors - II  
Lecture 14 - Design of Three-Phase Induction Motors - III  
Lecture 15 - Design of Three-Phase Induction Motors - IV  
Lecture 16 - Design of Single-Phase Induction Machine - I  
Lecture 17 - Design of Single-Phase Induction Machine - II  
Lecture 18 - Design of Single-Phase Induction Machine - III  
Lecture 19 - Design of Three-Phase Synchronous Machines - I  
Lecture 20 - Design of Three-Phase Synchronous Machines - II  
Lecture 21 - Design of Three-Phase Synchronous Machines - III  
Lecture 22 - Design of Three-Phase Synchronous Machines - IV  
Lecture 23 - Design of Synchronous Reluctance Machines - I  
Lecture 24 - Design of Synchronous Reluctance Machines - II  
Lecture 25 - Design of Synchronous Reluctance Machines - III  
Lecture 26 - Design of Brushless PM Machines - I  
Lecture 27 - Design of Brushless PM Machines - II  
Lecture 28 - Design of Brushless PM Machines - III  
Lecture 29 - Design of Brushless PM Machines - IV

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

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- Lecture 30 - Design of Brushless PM Machines - V
- Lecture 31 - Design of Switched Reluctance Machines - I
- Lecture 32 - Design of Switched Reluctance Machines - II
- Lecture 33 - Design of Switched Reluctance Machines - III
- Lecture 34 - Design of Stepper Machines - I
- Lecture 35 - Design of Stepper Machines - II
- Lecture 36 - Design of Axial Flux Machines - I
- Lecture 37 - Design of Axial Flux Machines - II
- Lecture 38 - Computer Aided Design and Analysis Method - I
- Lecture 39 - Computer Aided Design and Analysis Method - II
- Lecture 40 - Case Studies and Tutorials - I and II
- Lecture 41 - Tutorial-III : Determination of Transformer Operating Point
- Lecture 42 - Tutorial-IV

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

NPTEL Video Course - Electrical Engineering - NOC:Electronic Systems Design: Hands-on Circuits and PCB Design

Subject Co-ordinator - Prof. Ankur Gupta

Co-ordinating Institute - IIT - Delhi

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

- Lecture 1 - Introduction
- Lecture 2 - Passive Circuit Elements: R, L and C
- Lecture 3 - Resistor color coding, Surface mount capacitors and inductors on PCBs
- Lecture 4 - Active Circuit Elements: MOSFET, BJTs
- Lecture 5 - Network Analysis: Kirchoff's Laws
- Lecture 6 - Network Theorems: Thevenin, Norton, Maximum Power Transfer etc
- Lecture 7 - Circuit Simulations using SPICE : Operating point analysis
- Lecture 8 - DC Simulations and Importing Third-Party Models
- Lecture 9 - Small-Signal Simulations, Transient Simulations
- Lecture 10 - PCB Substrate and layers
- Lecture 11 - Interconnect design
- Lecture 12 - CMOS inverter basics
- Lecture 13 - CMOS inverter design
- Lecture 14 - Combinational Circuit Design - Part 1
- Lecture 15 - Combinational Circuit Design - Part 2
- Lecture 16 - Dynamic Logic Circuit Design
- Lecture 17 - Sequential Logic Circuit Design
- Lecture 18 - Digital Design : Boolean Algebra
- Lecture 19 - Logic Families, Component Datasheets
- Lecture 20 - TTL/CMOS logic Interfacing Constraints
- Lecture 21 - Hardware Description Languages : VHDL and Verilog
- Lecture 22 - Introduction to Verilog Simulations Software
- Lecture 23 - Combinational Circuit Simulation using iVerilog
- Lecture 24 - Adders, Multiplexer Simulation using iVerilog
- Lecture 25 - High-Speed PCBs
- Lecture 26 - Signal Integrity in PCBs
- Lecture 27 - Signal Cross-Talk, Skews and Jitter in PCBs
- Lecture 28 - KiCad Software Workflow
- Lecture 29 - KiCad Design Modules

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

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- Lecture 30 - KiCad Schematic Design Steps
- Lecture 31 - KiCad PCB Design Steps
- Lecture 32 - KiCad Custom Symbol and Footprints Creation
- Lecture 33 - KiCad Example : PCB design using OpAmp IC
- Lecture 34 - KiCad Example : PCB design using 555 Timer IC
- Lecture 35 - RF PCB Design Guidelines
- Lecture 36 - RF PCB Example

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

NPTEL Video Course - Electrical Engineering - Advanced Control Systems

Subject Co-ordinator - Prof. S. Majhi

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction
- Lecture 2 - Control structures and performance measures
- Lecture 3 - Time and frequency domain performance measures
- Lecture 4 - Design of controller
- Lecture 5 - Design of controller for SISO system
- Lecture 6 - Controller design for TITO processes
- Lecture 7 - Limitations of PID controllers
- Lecture 8 - PI-PD controller for SISO system
- Lecture 9 - PID-P controller for Two Input Two Output system
- Lecture 10 - Effects of measurement noise and load
- Lecture 11 - Identification of dynamic models of plants
- Lecture 12 - Relay control system for identification
- Lecture 13 - Off-line identification of process dynamics
- Lecture 14 - On-line identification of plant dynamics
- Lecture 15 - State space based identification
- Lecture 16 - State space analysis of systems
- Lecture 17 - State space based identification of systems - 1
- Lecture 18 - State space based identification of systems - 2
- Lecture 19 - Identification of simple systems
- Lecture 20 - Identification of FOPDT model
- Lecture 21 - Identification of second order plus dead time model
- Lecture 22 - Identification of SOPDT model
- Lecture 23 - Steady state gain from asymmetrical relay test
- Lecture 24 - Identification of SOPDT model with pole multiplicity
- Lecture 25 - Existence of limit cycle for unstable system
- Lecture 26 - Identification procedures
- Lecture 27 - Identification of underdamped systems
- Lecture 28 - Off-line identification of TITO systems
- Lecture 29 - On-line identification of TITO systems

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

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- Lecture 30 - Review of time domain based identification
- Lecture 31 - DF based analytical expressions for on-line identification
- Lecture 32 - Model parameter accuracy and sensitivity
- Lecture 33 - Improved identification using Fourier series and wavelet transform
- Lecture 34 - Reviews of DF based identification
- Lecture 35 - Advanced Smith predictor controller
- Lecture 36 - Design of controllers for the advanced Smith predictor
- Lecture 37 - Model-free controller design
- Lecture 38 - Model Based PID controller Design - I
- Lecture 39 - Model Based PI-PD controller Design - II
- Lecture 40 - Tuning of reconfigurable PID controllers

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

NPTEL Video Course - Electrical Engineering - NOC:Optimization Techniques for Digital VLSI Design

Subject Co-ordinator - Dr. Santosh Biswas, Prof. Chandan Karfa

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Digital VLSI Design Flow
- Lecture 2 - High-level Synthesis (HLS) flow with an example
- Lecture 3 - Automation of High-level Synthesis Steps
- Lecture 4 - Impact of Coding Style on HLS Results
- Lecture 5 - Impact of Compiler Optimizations on HLS Results
- Lecture 6 - RTL Optimizations for Timing
- Lecture 7 - Retiming
- Lecture 8 - RTL Optimizations for Area
- Lecture 9 - RTL Optimizations for Power
- Lecture 10 - High Level Synthesis
- Lecture 11 - Overview of FPGA Technology Mapping
- Lecture 12 - Introduction to Physical Synthesis
- Lecture 13 - Introduction to Digital VLSI Testing - I
- Lecture 14 - Introduction to Digital VLSI Testing - II
- Lecture 15 - Optimization Techniques for ATPG - Part I
- Lecture 16 - Optimization Techniques for ATPG - Part II
- Lecture 17 - Optimization Techniques for Design for Testability
- Lecture 18 - High-level fault modeling and RTL level Testing
- Lecture 19 - LTL/CTL based Verification
- Lecture 20 - Verification of Large Scale Systems
- Lecture 21 - BDD based verification
- Lecture 22 - Verification
- Lecture 23 - Verification
- Lecture 24 - Verification

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

NPTEL Video Course - Electrical Engineering - NOC:Advanced Topics in Probability and Random Processes

Subject Co-ordinator - Prof. Prabin K Bora

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Probability Basics
- Lecture 2 - Random Variable - I
- Lecture 3 - Random Variable - II
- Lecture 4 - Random Vectors and Random Processes
- Lecture 5 - Infinite Sequence of Events - I
- Lecture 6 - Infinite Sequence of Events - II
- Lecture 7 - Convergence of Sequence of Random Variables
- Lecture 8 - Weak Convergence - I
- Lecture 9 - Weak Convergence - II
- Lecture 10 - Laws of Large Numbers
- Lecture 11 - Central Limit Theorem
- Lecture 12 - Large Deviation Theory
- Lecture 13 - Crammer's Theorem for Large Deviation
- Lecture 14 - Introduction to Markov Processes
- Lecture 15 - Discrete Time Markov Chain - 1
- Lecture 16 - Discrete Time Markov Chain - 2
- Lecture 17 - Discrete Time Markov Chain - 3
- Lecture 18 - Discrete Time Markov Chain - 4
- Lecture 19 - Discrete Time Markov Chain - 5
- Lecture 20 - Continuous Time Markov Chain - 1
- Lecture 21 - Continuous Time Markov Chain - 2
- Lecture 22 - Continuous Time Markov Chain - 3
- Lecture 23 - Martingale Process - 1
- Lecture 24 - Martingale Process - 2

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

NPTEL Video Course - Electrical Engineering - NOC: Microwave Engineering

Subject Co-ordinator - Dr. Ratnajit Bhattacharjee

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Microwave Engineering
- Lecture 2 - Introduction to Transmission Line Theory
- Lecture 3 - Lossy Transmission Line
- Lecture 4 - Smith Chart
- Lecture 5 - Introduction to Waveguides and Rectangular Waveguide
- Lecture 6 - Circular Waveguide
- Lecture 7 - Attenuation Waveguide
- Lecture 8 - N-port microwave networks and equivalent voltages and currents
- Lecture 9 - Scattering Matrix (S-Parameters) Part-1
- Lecture 10 - Scattering Matrix (S-parameters) Part-2 and Transmission Matrix (ABCD-Parameters)
- Lecture 11 - Impedance Matching Using L-Section and Series Stub Networks
- Lecture 12 - Impedance Matching Using Shunt Stub, Double Stub and Quarter wave Transformer
- Lecture 13 - Multisection Matching Networks and Tapered Lines
- Lecture 14 - Series and Parallel RLC Resonators
- Lecture 15 - Transmission Line Resonators
- Lecture 16 - Waveguide Resonators
- Lecture 17 - Introduction to power dividers
- Lecture 18 - Directional couplers
- Lecture 19 - Microwave Filters - Part 1
- Lecture 20 - Microwave Filters - Part 2
- Lecture 21 - Characteristics of Microwave BJT and FET
- Lecture 22 - PIN Diodes and Control Circuits
- Lecture 23 - Schottky Diodes and Detectors and Tunnel Diodes
- Lecture 24 - Gunn Diodes, IMPATT Diodes and Varactor Diodes
- Lecture 25 - Two-Port Power Gain and Stability
- Lecture 26 - Design of single stage transistor amplifier (for maximum gain, specified gain, low noise)
- Lecture 27 - RF oscillator
- Lecture 28 - Limitations of Conventional Tubes at Microwave Ranges
- Lecture 29 - Introduction to Klystron

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

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- Lecture 30 - Reflex Klystron, Magnetron and TWT
- Lecture 31 - Ferrite Devices
- Lecture 32 - Planar transmission lines for MIC
- Lecture 33 - Lumped elements for MIC
- Lecture 34 - Lumped inductor, HMIC and MMIC
- Lecture 35 - Overview of Radar
- Lecture 36 - Cellular Communication
- Lecture 37 - Satellite Communication and Applications of Microwave

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

NPTEL Video Course - Electrical Engineering - NOC:Microprocessors and Interfacing

Subject Co-ordinator - Prof. Shaik Rafi Ahamed

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Microprocessor Operations  
Lecture 2 - 8086 Flags  
Lecture 3 - Functional Diagram of 8086  
Lecture 4 - 8086 Common and Minimum Mode Signals  
Lecture 5 - 8086 Maximum Mode Signals  
Lecture 6 - 8086 Data Transfer Instructions  
Lecture 7 - 8086 Arithmetic Instructions - I  
Lecture 8 - 8086 Arithmetic Instructions - II  
Lecture 9 - 8086 Logical Instructions  
Lecture 10 - 8086 Branch and String Instructions  
Lecture 11 - 8086 Interrupt and Machine Control Instructions  
Lecture 12 - Sum of Products, Multi-byte addition  
Lecture 13 - Largest number, 2's complement Programs  
Lecture 14 - Programs on Subroutines  
Lecture 15 - ROM, RAM  
Lecture 16 - Example I  
Lecture 17 - Example II  
Lecture 18 - Architecture, Interfacing to Simple I/O  
Lecture 19 - Keyboard Interface  
Lecture 20 - 7-segment Display Interface  
Lecture 21 - Multiplexed 7-segment Display Interface  
Lecture 22 - Stepper motor, Liquid level control  
Lecture 23 - Traffic light control, A/D converter  
Lecture 24 - D/A converter  
Lecture 25 - Electronic weighing machine  
Lecture 26 - Programmable Interval Timer (8254)  
Lecture 27 - Modes of 8254  
Lecture 28 - Architecture of 8259  
Lecture 29 - Initialization command words of 8259

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

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- Lecture 30 - Operational command words of 8259
- Lecture 31 - 8237 Architecture, interfacing and Programming
- Lecture 32 - Basic Concepts of serial I/O
- Lecture 33 - Basic Concepts of serial I/O (Continued...)
- Lecture 34 - Architecture of 8251

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

NPTEL Video Course - Electrical Engineering - NOC:Statistical Signal Processing

Subject Co-ordinator - Prof. Prabin Kumar Bora

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Overview of Statistical Signal Processing  
Lecture 2 - Probability and Random Variables  
Lecture 3 - Linear Algebra of Random Variables  
Lecture 4 - Random Processes  
Lecture 5 - Linear Shift Invariant Systems with Random Inputs  
Lecture 6 - White Noise and Spectral Factorization Theorem  
Lecture 7 - Linear Models of Random Signals  
Lecture 8 - Estimation Theory - 1  
Lecture 9 - Estimation Theory - 2  
Lecture 10 - Cramer Rao Lower Bound 2  
Lecture 11 - MVUE through Sufficient Statistic - 1  
Lecture 12 - MVUE through Sufficient Statistic - 2  
Lecture 13 - Method of Moments and Maximum Likelihood Estimators  
Lecture 14 - Properties of Maximum Likelihood Estimator (MLE)  
Lecture 15 - Bayesian Estimators - 1  
Lecture 16 - Bayesian Estimators - 2  
Lecture 17 - Optimal linear filters  
Lecture 18 - FIR Wiener filter  
Lecture 19 - Non-Causal IIR Wiener Filter  
Lecture 20 - Causal IIR Wiener Filter  
Lecture 21 - Linear Prediction of Signals - 1  
Lecture 22 - Linear Prediction of Signals - 2  
Lecture 23 - Linear Prediction of Signals - 3  
Lecture 24 - Review Assignment - 1  
Lecture 25 - Adaptive Filters - 1  
Lecture 26 - Adaptive Filters - 2  
Lecture 27 - Adaptive Filters - 3  
Lecture 28 - Review Assignment - 2  
Lecture 29 - Adaptive Filters - 4

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

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- Lecture 30 - Adaptive Filters - 4 (Continued...)
- Lecture 31 - Review Assignment - 3
- Lecture 32 - Recursive Least Squares (RLS) Adaptive Filter - 1
- Lecture 33 - Recursive Least Squares (RLS) Adaptive Filter - 2
- Lecture 34 - Review Assignment - 4
- Lecture 35 - Kalman Filter - 1
- Lecture 36 - Vector Kalman Filter
- Lecture 37 - Linear Models of Random Signals
- Lecture 38 - Review - 1
- Lecture 39 - Review - 2

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

NPTEL Video Course - Electrical Engineering - NOC:Computer Vision and Image Processing - Fundamentals and App

Subject Co-ordinator - Prof. M. K. Bhuyan

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Digital Image Processing
- Lecture 2 - Introduction to Computer Vision
- Lecture 3 - Introduction to Computer Vision and Basic Concepts of Image Formation
- Lecture 4 - Shape From Shading
- Lecture 5 - Image Formation: Geometric Camera Models - I
- Lecture 6 - Image Formation: Geometric Camera Models - II
- Lecture 7 - Image Formation: Geometric Camera Models - III
- Lecture 8 - Image Formation in a Stereo Vision Setup
- Lecture 9 - Image Reconstruction from a Series of Projections
- Lecture 10 - Image Reconstruction from a Series of Projections
- Lecture 11 - Image Transforms - I
- Lecture 12 - Image Transforms - II
- Lecture 13 - Image Transforms - III
- Lecture 14 - Image Transforms - IV
- Lecture 15 - Image Enhancement
- Lecture 16 - Image Filtering - I
- Lecture 17 - Image Filtering - II
- Lecture 18 - Colour Image Processing - I
- Lecture 19 - Colour Image Processing - II
- Lecture 20 - Image Segmentation
- Lecture 21 - Image Features and Edge Detection
- Lecture 22 - Edge Detection
- Lecture 23 - Hough Transform
- Lecture 24 - Image Texture Analysis - I
- Lecture 25 - Image Texture Analysis - II
- Lecture 26 - Object Boundary and Shape Representations - I
- Lecture 27 - Object Boundary and Shape Representations - II
- Lecture 28 - Interest Point Detectors
- Lecture 29 - Image Features - HOG and SIFT

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

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- Lecture 30 - Introduction to Machine Learning - I
- Lecture 31 - Introduction to Machine Learning - II
- Lecture 32 - Introduction to Machine Learning - III
- Lecture 33 - Introduction to Machine Learning - IV
- Lecture 34 - Introduction to Machine Learning - V
- Lecture 35 - Artificial Neural Network for Pattern Classification - I
- Lecture 36 - Artificial Neural Network for Pattern Classification - II
- Lecture 37 - Introduction to Deep Learning
- Lecture 38 - Gesture Recognition
- Lecture 39 - Background Modelling and Motion Estimation
- Lecture 40 - Object Tracking
- Lecture 41 - Programming Examples

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

NPTEL Video Course - Electrical Engineering - NOC: System Design through VERILOG

Subject Co-ordinator - Prof. Shaik Rafi Ahamed

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Verilog Operators and Modules
- Lecture 2 - Verilog Ports, Data types and Assignments
- Lecture 3 - Basics of gate level modeling
- Lecture 4 - Half adder, full adder and ripple carry adder
- Lecture 5 - Parallel adder/subtractor
- Lecture 6 - Multiplier and comparator
- Lecture 7 - Decoder, encoder and multiplexer
- Lecture 8 - Demultiplexer, read only memory
- Lecture 9 - Review of flip-flops
- Lecture 10 - Verilog modeling of flip-flops
- Lecture 11 - Modeling of CMOS gates and Boolean functions
- Lecture 12 - Modeling using transmission gates, CMOS delay times
- Lecture 13 - Signal strengths
- Lecture 14 - Basics of dataflow modeling
- Lecture 15 - Examples of dataflow modeling
- Lecture 16 - Basics of behavioral modeling
- Lecture 17 - Examples of behavioral modeling
- Lecture 18 - Verilog modeling of counters
- Lecture 19 - Verilog modeling of sequence detector
- Lecture 20 - Verilog modeling FSMs and shift registers
- Lecture 21 - Combinational circuit examples
- Lecture 22 - Sequential circuit examples
- Lecture 23 - Arithmetic and Logic Unit (ALU)
- Lecture 24 - Static RAM and Braun Multiplier
- Lecture 25 - FIR filter implementation
- Lecture 26 - Baugh-Wooley signed multiplier architecture
- Lecture 27 - IIR filter implementation

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

NPTEL Video Course - Electrical Engineering - NOC:Usability Engineering

Subject Co-ordinator - Prof. Debayan Dhar

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction to Usability  
Lecture 2 - Usability - Historical Foundations  
Lecture 3 - Standard Terminologies  
Lecture 4 - Elements of User Experience  
Lecture 5 - Usability in software development - I  
Lecture 6 - Usability in software development - II  
Lecture 7 - User Centered Design Process - I  
Lecture 8 - User Centered Design Process - II  
Lecture 9 - User Centered Design Process - III  
Lecture 10 - Requirement Analysis - I (A)  
Lecture 11 - Requirement Analysis - I (B)  
Lecture 12 - Requirement Analysis - I (C)  
Lecture 13 - Requirement Analysis - I (D)  
Lecture 14 - Requirement Analysis - I (E)  
Lecture 15 - Requirement Analysis - I (F)  
Lecture 16 - Requirement Analysis - II (A)  
Lecture 17 - Requirement Analysis - II (B)  
Lecture 18 - Requirement Analysis - II (C)  
Lecture 19 - Requirement Analysis - II (D)  
Lecture 20 - Requirement Analysis - III (A)  
Lecture 21 - Eye Tracker  
Lecture 22 - Demonstration of an Eye tracking device  
Lecture 23 - Requirement Analysis - III (B)  
Lecture 24 - Mapping Experiences  
Lecture 25 - Cognitive Issues - I  
Lecture 26 - Cognitive Issues - II  
Lecture 27 - Cognitive Issues - III  
Lecture 28 - Cognitive Issues - IV  
Lecture 29 - Competitive analysis and preparing for design briefing - I

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

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- Lecture 30 - Competitive analysis and preparing for design briefing - II
- Lecture 31 - Conceptualization and Prototyping - I (A)
- Lecture 32 - Conceptualization and Prototyping - I (B)
- Lecture 33 - Conceptualization and Prototyping - I (C)
- Lecture 34 - Conceptualization and Prototyping - II (A)
- Lecture 35 - Conceptualization and Prototyping - II (B)
- Lecture 36 - Usability heuristics and testing - I
- Lecture 37 - Usability heuristics and testing - II
- Lecture 38 - Usability heuristics and testing - III
- Lecture 39 - Usability Testing (A)
- Lecture 40 - Usability Testing (B)
- Lecture 41 - Usability Testing (C)
- Lecture 42 - UI/UX design based on Garret model: a case study
- Lecture 43 - Effective contextual enquiry
- Lecture 44 - Contextual enquiry: case study

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

NPTEL Video Course - Electrical Engineering - NOC:Probability and Random Processes

Subject Co-ordinator - Prof. Ribhu, Prof. Rohit Sinha

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction  
Lecture 2 - Algebra of Events  
Lecture 3 - Axioms of Probability  
Lecture 4 - Example 1  
Lecture 5 - Example 2  
Lecture 6 - Example 3  
Lecture 7 - Example 4  
Lecture 8 - Example 5  
Lecture 9 - Conditional Probability  
Lecture 10 - Bayes Theorem 1  
Lecture 11 - Bayes Theorem 2  
Lecture 12 - A Brief Review  
Lecture 13 - Example 1  
Lecture 14 - Example 2  
Lecture 15 - Example 3  
Lecture 16 - Example 4  
Lecture 17 - Example 5  
Lecture 18 - Independent Events  
Lecture 19 - A Brief Review  
Lecture 20 - Example 1  
Lecture 21 - Example 2  
Lecture 22 - Example 3  
Lecture 23 - Example 4  
Lecture 24 - Discrete Random Variables  
Lecture 25 - Expectation  
Lecture 26 - Moments  
Lecture 27 - Variance  
Lecture 28 - Binomial Random Variables  
Lecture 29 - Poisson Random Variables

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

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- Lecture 30 - More on Poission Random Variables
- Lecture 31 - Properties of the CDF
- Lecture 32 - A Brief Review - I
- Lecture 33 - A Brief Review - II
- Lecture 34 - Example 1
- Lecture 35 - Example 2
- Lecture 36 - Example 3
- Lecture 37 - Example 4
- Lecture 38 - Example 5
- Lecture 39 - Example 6
- Lecture 40 - Example 7
- Lecture 41 - Example 8
- Lecture 42 - Example 9
- Lecture 43 - Continuous Random Variables
- Lecture 44 - Expectation of Continuous random variables
- Lecture 45 - The uniform and the Gaussian Random variables
- Lecture 46 - The mean and variance of a Gaussian Random Variable
- Lecture 47 - The exponential random variable and other continuous distributions
- Lecture 48 - A Brief Review
- Lecture 49 - Example 1
- Lecture 50 - Example 2
- Lecture 51 - Example 3
- Lecture 52 - Example 4
- Lecture 53 - Example 5
- Lecture 54 - Functions of a random variable
- Lecture 55 - Functions of a random variable
- Lecture 56 - The moment generating function
- Lecture 57 - Conditional Distributions
- Lecture 58 - Bivariate Distributions
- Lecture 59 - Independence of Random Variables
- Lecture 60 - Jointly Gaussian Random Variables and Circular symmetry
- Lecture 61 - Jointly Discrete Random Variables
- Lecture 62 - One Function of two random variables
- Lecture 63 - Order Statistics
- Lecture 64 - Two functions of two random variables
- Lecture 65 - Joint Moments
- Lecture 66 - Joint Characteristic Functions
- Lecture 67 - Conditional Distributions for multiple random variables
- Lecture 68 - Conditional Expectations

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

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- Lecture 69 - Examples
- Lecture 70 - Random Vectors
- Lecture 71 - Independence of Random Variables
- Lecture 72 - Complex Random Variables
- Lecture 73 - Covariance Matrices
- Lecture 74 - Conditional Densities
- Lecture 75 - Gaussianity
- Lecture 76 - Chi Squared Densities
- Lecture 77 - Examples
- Lecture 78 - Estimation Theory
- Lecture 79 - Measurements
- Lecture 80 - Sequences of Random Variables
- Lecture 81 - Laws of large numbers
- Lecture 82 - Random processes
- Lecture 83 - Stationarity, Cyclostationarity, Ergodicity
- Lecture 84 - Random Processes as Signals (PSD and LTI Response)
- Lecture 85 - White and Gaussian Processes Noise

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

NPTEL Video Course - Electrical Engineering - NOC:Simulation of Communication Systems using Matlab

Subject Co-ordinator - Dr. Ribhu

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction  
Lecture 2 - Basics of MATLAB  
Lecture 3 - Data Types  
Lecture 4 - Floating Point Numbers  
Lecture 5 - Scripts and Flow of Control  
Lecture 6 - The For Loop  
Lecture 7 - Arrays  
Lecture 8 - Indexing  
Lecture 9 - Some Results from Linear Algebra  
Lecture 10 - Matrix Multiplication  
Lecture 11 - Eigenvalues and Eigenvectors  
Lecture 12 - Complex Numbers  
Lecture 13 - Hermitian Matrices  
Lecture 14 - Matrix Inversion  
Lecture 15 - Signals  
Lecture 16 - Convolution  
Lecture 17 - Probability  
Lecture 18 - Bayes Theorem  
Lecture 19 - Random Variables  
Lecture 20 - Clinical Trials - I  
Lecture 21 - Clinical Trials - II  
Lecture 22 - Random Numbers  
Lecture 23 - Random Distributions  
Lecture 24 - Histograms - I  
Lecture 25 - Histograms - II  
Lecture 26 - Functions of Random Variables  
Lecture 27 - Generating Random Distributions  
Lecture 28 - Laws of Large numbers  
Lecture 29 - Random Processes

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

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- Lecture 30 - Properties of Random Processes
- Lecture 31 - Power Spectra
- Lecture 32 - Signals and Noise
- Lecture 33 - Stochastic Models
- Lecture 34 - The AR-1 Process
- Lecture 35 - Stochastic Models II
- Lecture 36 - Yule Walker Equations
- Lecture 37 - Markov Chains - I
- Lecture 38 - Markov Chains - II
- Lecture 39 - Markov Chains - III
- Lecture 40 - Analog to Digital Conversion
- Lecture 41 - K Means
- Lecture 42 - Correlation
- Lecture 43 - Predictive Coding
- Lecture 44 - Image Compression
- Lecture 45 - Transform Domain Compression
- Lecture 46 - Multi Resolution Coding
- Lecture 47 - Introduction to Communications
- Lecture 48 - Low Pass and BandPass Signals
- Lecture 49 - Signal Spaces
- Lecture 50 - PAM
- Lecture 51 - Detection
- Lecture 52 - Effects of AWGN
- Lecture 53 - ML Detection - I
- Lecture 54 - ML Detection - II
- Lecture 55 - The Union Bound
- Lecture 56 - Symbol Error Rates
- Lecture 57 - Choosing Constellations
- Lecture 58 - Orthogonal Signalling
- Lecture 59 - Non-Coherent Detection - 1
- Lecture 60 - Non-Coherent Detection - 2
- Lecture 61 - DPSK - I
- Lecture 62 - DPSK - II
- Lecture 63 - Introduction to Wireless Communications
- Lecture 64 - Conclusion

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

NPTEL Video Course - Electrical Engineering - NOC:Machine Learning and Deep Learning - Fundamentals and Appli

Subject Co-ordinator - Prof. M.K. Bhuyan

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Machine Learning
- Lecture 2 - Performance Measures of Classification
- Lecture 3 - Bias-Variance Tradeoff
- Lecture 4 - Regression
- Lecture 5 - Bayesian Decision Theory - 1
- Lecture 6 - Bayesian Decision Theory - 2
- Lecture 7 - Bayes Decision Theory - Binary Features
- Lecture 8 - Bayesian Decision Theory - 3
- Lecture 9 - Bayesian Decision Theory - 4
- Lecture 10 - Bayesian Belief Networks
- Lecture 11 - Parameter Estimation and Maximum Likelihood Estimation
- Lecture 12 - Parameter Estimation and Bayesian Estimation
- Lecture 13 - Concept of non-parametric techniques
- Lecture 14 - Density Estimation by Parzen Window
- Lecture 15 - Parzen Window and K nearest neighbor algorithm
- Lecture 16 - Linear Discriminant Functions and Perceptron Criteria - Part I
- Lecture 17 - Linear Discriminant Functions and Perceptron Criteria - Part II
- Lecture 18 - Linear Discriminant Functions and Perceptron Criteria - Part III
- Lecture 19 - Support Vector Machine - Part I
- Lecture 20 - Support Vector Machine - Part II
- Lecture 21 - Logistic Regression
- Lecture 22 - Decision Tree
- Lecture 23 - Hidden Markov Model (HMM)
- Lecture 24 - Ensemble Classifiers - Part I
- Lecture 25 - Ensemble Classifiers - Part II
- Lecture 26 - Dimensionality Problem and Principal Component Analysis
- Lecture 27 - Principal Component Analysis
- Lecture 28 - Linear Discriminant Analysis (LDA) - Part I
- Lecture 29 - Linear Discriminant Analysis (LDA) - Part II

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

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- Lecture 30 - Gaussian Mixture Model and EM Algorithm
- Lecture 31 - K-means clustering.
- Lecture 32 - Fuzzy K-means clustering
- Lecture 33 - Hierarchical Agglomerative Clustering and Mean-shift Clustering
- Lecture 34 - Artificial Neural Networks for Pattern Classification - Part 1
- Lecture 35 - Artificial Neural Networks for Pattern Classification - Part 2
- Lecture 36 - Artificial Neural Networks for Pattern Classification - Part 3
- Lecture 37 - Introduction to Deep Learning and Convolutional Neural Network (CNN)
- Lecture 38 - Vanishing and Exploding Gradients in Deep Neural Networks
- Lecture 39 - CNN Architectures - LeNet-5 and AlexNet
- Lecture 40 - CNN Architectures - VGG 16, GoogLeNet and ResNet
- Lecture 41 - Generative Adversarial Networks (GAN) - Fundamentals and Applications
- Lecture 42 - U-Net: Convolutional Networks for Image Segmentation
- Lecture 43 - Introduction to Autoencoder and Recurrent Neural Networks (RNN)
- Lecture 44 - Programming Concepts - 1
- Lecture 45 - Programming Concepts - 2
- Lecture 46 - Problem Solving Session - 1
- Lecture 47 - Problem Solving Session - 2
- Lecture 48 - Problem Solving Session - 3

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

NPTEL Video Course - Electrical Engineering - NOC: Integrated Circuits and Applications

Subject Co-ordinator - Prof. Shaik Rafi Ahamed

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Introduction to Integrated Circuits
- Lecture 2 - Summing and Difference Amplifiers
- Lecture 3 - Instrumentation Amplifier
- Lecture 4 - Integrator and Differentiator
- Lecture 5 - Precision Half Wave and Full Wave Rectifiers
- Lecture 6 - Clipper and Clamper circuits
- Lecture 7 - Logarithmic and Anti-logarithmic Amplifiers
- Lecture 8 - DC Characteristics (Offset Currents and Voltages)
- Lecture 9 - AC Characteristics (Frequency Response)
- Lecture 10 - AC Characteristics (Compensation Techniques and Slew Rate)
- Lecture 11 - Examples on Design of Adder and Subtractor Circuits
- Lecture 12 - Examples on Transfer Function Computation
- Lecture 13 - Examples on Instrumentation Amplifier
- Lecture 14 - Examples on CMRR Computation
- Lecture 15 - First Order Low Pass Filter
- Lecture 16 - Second Order Low Pass Filter
- Lecture 17 - Design of Butterworth Low Pass Filter
- Lecture 18 - Design of Butterworth High Pass Filter
- Lecture 19 - Design of Band Pass Filter
- Lecture 20 - Design of Band Stop Filter
- Lecture 21 - All Pass Filter
- Lecture 22 - RC Phase Shift Oscillator
- Lecture 23 - Wien Bridge, Colpitt's and Hartley Oscillators
- Lecture 24 - Comparator and Schmitt Trigger Circuits
- Lecture 25 - Square Wave and Triangular Waveform Generators
- Lecture 26 - Monostable operation
- Lecture 27 - Monostable applications - I
- Lecture 28 - Monostable applications - II
- Lecture 29 - Astable operation

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

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- Lecture 30 - Phase detectors
- Lecture 31 - Voltage Controlled oscillator
- Lecture 32 - PLL IC 565 operation
- Lecture 33 - PLL Applications
- Lecture 34 - Fixed Voltage Regulator
- Lecture 35 - Adjustable Voltage Regulator
- Lecture 36 - Switching Regulators
- Lecture 37 - Weighted Resistor D/A Converter
- Lecture 38 - R-2R Ladder D/A Converter
- Lecture 39 - Inverted R-2R Ladder D/A Converter
- Lecture 40 - Analog to Digital Converters
- Lecture 41 - CMOS Inverter
- Lecture 42 - CMOS NAND Gate
- Lecture 43 - Transient Response of CMOS NAND and NOR Gates
- Lecture 44 - Boolean function Realization using CMOS and Sizing

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

NPTEL Video Course - Electrical Engineering - NOC:Photonic Crystals: Fundamentals and Applications

Subject Co-ordinator - Prof. Debabrata Sikdar

Co-ordinating Institute - IIT - Guwahati

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

- Lecture 1 - Motivation and Introduction to Photonic Crystals
- Lecture 2 - Overview of Photonic Crystal technology
- Lecture 3 - Fundamentals of EM theory of Light
- Lecture 4 - Electromagnetic Properties of Materials
- Lecture 5 - Scaling Properties of Maxwell's Equations
- Lecture 6 - Electromagnetism as an Eigenvalue Problem
- Lecture 7 - Symmetries for Classification of EM Modes
- Lecture 8 - Real and Reciprocal lattices
- Lecture 9 - Photonic band Structure: Computation and Analysis
- Lecture 10 - Fundamentals of 1D Photonic Crystal
- Lecture 11 - Analysis and Engineering of 1D Photonic Band Structure
- Lecture 12 - Applications of 1D Photonic Crystal
- Lecture 13 - Fundamentals of 2D photonic crystals
- Lecture 14 - Analysis and Engineering of 2D Photonic Band Structure
- Lecture 15 - Applications of 2D photonic crystals
- Lecture 16 - Overview of different 3D Photonic Crystals
- Lecture 17 - Crystals with complete bandgap
- Lecture 18 - Applications of 2D and 3D photonic crystals
- Lecture 19 - Overview and Modelling of Periodic Dielectric Waveguides
- Lecture 20 - Point Defects in Periodic Dielectric Waveguides and Q-factors of Lossy Cavities
- Lecture 21 - Applications: Fiber Bragg Grating
- Lecture 22 - Overview of Photonic Crystal Slabs
- Lecture 23 - Different types of defects in Photonic Crystal Slabs
- Lecture 24 - Engineering High-Q resonant Cavity
- Lecture 25 - Overview of photonic crystal fibers
- Lecture 26 - Index-guiding photonic crystal fibers
- Lecture 27 - Band-gap guidance in Hollow Core Fibers
- Lecture 28 - Overview of Bragg Fibers
- Lecture 29 - Losses in Hollow-core Fibers

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

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- Lecture 30 - Applications of Photonic Crystal Fibers
- Lecture 31 - Designing a mirror, waveguide, acavity
- Lecture 32 - Temporal Coupled Mode Theory: Fundamentals and Applications
- Lecture 33 - Waveguide Splitters, Non-linear Filters, and Bistability
- Lecture 34 - Unusual Refraction and Diffraction Effects
- Lecture 35 - Photonic Crystal Devices for Slow Wave Phenomena
- Lecture 36 - Next Generation Devices based on Photonic Crystals
- Lecture 37 - Simulation Demonstration of Topological Photonic Crystals Based Waveguides - Part 1
- Lecture 38 - Simulation Demonstration of Topological Photonic Crystals Based Waveguides - Part 2

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

NPTEL Video Course - Electrical Engineering - Advanced Electric Drives

Subject Co-ordinator - Dr. S.P. Das

Co-ordinating Institute - IIT - Kanpur

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

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

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Lecture 30  
Lecture 31  
Lecture 32  
Lecture 33  
Lecture 34  
Lecture 35  
Lecture 36  
Lecture 37  
Lecture 38  
Lecture 39  
Lecture 40

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

NPTEL Video Course - Electrical Engineering - High Voltage DC Transmission

Subject Co-ordinator - Dr. S.N. Singh

Co-ordinating Institute - IIT - Kanpur

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

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

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

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Lecture 30 - High Voltage DC Transmission  
Lecture 31 - High Voltage DC Transmission  
Lecture 32 - High Voltage DC Transmission  
Lecture 33 - High Voltage DC Transmission  
Lecture 34 - High Voltage DC Transmission  
Lecture 35 - High Voltage DC Transmission  
Lecture 36 - High Voltage DC Transmission  
Lecture 37 - High Voltage DC Transmission

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

NPTEL Video Course - Electrical Engineering - Intelligent Systems and Control

Subject Co-ordinator - Prof. Laxmidhar Behera

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Intelligent Systems and Control
- Lecture 2 - Linear Neural networks
- Lecture 3 - Multi layered Neural Networks
- Lecture 4 - Back Propagation Algorithm revisited
- Lecture 5 - Non Linear System Analysis - Part I
- Lecture 6 - Non Linear System Analysis - Part II
- Lecture 7 - Radial Basis Function Networks
- Lecture 8 - Adaptive Learning rate
- Lecture 9 - Weight update rules
- Lecture 10 - Recurrent networks Back propagation through time
- Lecture 11 - Recurrent networks Real time recurrent learning
- Lecture 12 - Self organizing Map - Multidimensional networks
- Lecture 13 - Fuzzy sets - A Primer
- Lecture 14 - Fuzzy Relations
- Lecture 15 - Fuzzy Rule base and Approximate Reasoning
- Lecture 16 - Introduction to Fuzzy Logic Control
- Lecture 17 - Neural Control A review
- Lecture 18 - Network inversion and Control
- Lecture 19 - Neural Model of a Robot manipulator
- Lecture 20 - Indirect Adaptive Control of a Robot manipulator
- Lecture 21 - Adaptive neural control for Affine Systems SISO
- Lecture 22 - Adaptive neural control for Affine systems MIMO
- Lecture 23 - Visual Motor Coordination with KSOM
- Lecture 24 - Visual Motor coordination - quantum clustering
- Lecture 25 - Direct Adaptive control of Manipulators - Intro
- Lecture 26 - NN based back stepping control
- Lecture 27 - Fuzzy Control - a Review
- Lecture 28 - Mamdani type flc and parameter optimization
- Lecture 29 - Fuzzy Control of a pH reactor

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- Lecture 30 - Fuzzy Lyapunov controller - Computing with words
- Lecture 31 - Controller Design for a T-S Fuzzy model
- Lecture 32 - Linear controllers using T-S fuzzy model

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

NPTEL Video Course - Electrical Engineering - Power Systems Operation and Control

Subject Co-ordinator - Dr. S.N. Singh

Co-ordinating Institute - IIT - Kanpur

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

Module 1 - Lecture 1  
Module 1 - Lecture 2  
Module 1 - Lecture 3  
Module 2 - Lecture 1  
Module 2 - Lecture 2  
Module 2 - Lecture 3  
Module 2 - Lecture 4  
Module 2 - Lecture 5  
Module 2 - Lecture 6  
Module 2 - Lecture 7  
Module 2 - Lecture 8  
Module 2 - Lecture 9  
Module 2 - Lecture 10  
Module 2 - Lecture 11  
Module 2 - Lecture 12  
Module 2 - Lecture 13  
Module 2 - Lecture 14  
Module 3 - Lecture 1  
Module 3 - Lecture 2  
Module 3 - Lecture 3  
Module 3 - Lecture 4  
Module 3 - Lecture 5  
Module 3 - Lecture 6  
Module 3 - Lecture 7  
Module 3 - Lecture 8  
Module 3 - Lecture 9  
Module 3 - Lecture 10  
Module 4 - Lecture 1  
Module 4 - Lecture 2

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

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Module 4 - Lecture 3  
Module 4 - Lecture 4  
Module 5 - Lecture 1  
Module 5 - Lecture 2  
Module 6 - Lecture 1  
Module 6 - Lecture 2

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

NPTEL Video Course - Electrical Engineering - NOC:Electromagnetic theory

Subject Co-ordinator - Dr. Pradeep Kumar K

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to EMT
- Lecture 2 - Coulombs law
- Lecture 3 - Vector analysis-I and Introduction to coordinate system
- Lecture 4 - Rectangular coordinate system
- Lecture 5 - Vector analysis-II
- Lecture 6 - Introduction to Electric field
- Lecture 7 - Electric field-I
- Lecture 8 - Cylindrical coordinate system
- Lecture 9 - Transformation and Electric field-II
- Lecture 10 - Electric Potential-I
- Lecture 11 - Spherical co-ordinate system and Electric potential-II
- Lecture 12 - Vector Analysis-III and Electric potential-III
- Lecture 13 - Gauss's law and its application-I
- Lecture 14 - Gauss's law and its application-II
- Lecture 15 - Divergence and Poisson's and Laplace's equation
- Lecture 16 - Gauss's law and its application -III
- Lecture 17 - Vector analysis  $\hat{\text{A}}$  III (curl and its significance)
- Lecture 18 - Conductor and dielectric-I
- Lecture 19 - Polarization - I
- Lecture 20 - Polarization - II
- Lecture 21 - Polarization - II (Continued...)
- Lecture 22 - Boundary condition
- Lecture 23 - Continuity equation and Conductors - III
- Lecture 24 - Conductors  $\hat{\text{A}}$  IV
- Lecture 25 - Conductors  $\hat{\text{A}}$  IV (Continued...) and Capacitor - I
- Lecture 26 - Capacitor - II
- Lecture 27 - Capacitor - II (Continued...) and Equipotential Surfaces
- Lecture 28 - Solution of Laplace's equation-I
- Lecture 29 - Solution of Laplace's equation-I I and method of images-I

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

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- Lecture 30 - Method of images-II
- Lecture 31 - Solution of Laplace's equation-III
- Lecture 32 - Solution of Laplace's equation-IV
- Lecture 33 - Introduction of magnetic field
- Lecture 34 - Biot savart law and its application
- Lecture 35 - Biot savart law and its application-II
- Lecture 36 - Magnetic vector potential
- Lecture 37 - Magnetic force, torque and dipole
- Lecture 38 - Magnetic force, torque and dipole (Continued...)
- Lecture 39 - Magnetic materials-I
- Lecture 40 - Magnetic materials-I (Continued...) and Magnetic moment
- Lecture 41 - Magnetic materials-I (Continued...) and Boundary condition for Magnetic fields
- Lecture 42 - Inductor and calculation of inductance for different shapes
- Lecture 43 - Inductor and calculation of inductance for different shapes (Continued...)
- Lecture 44 - Faradays law and its application-I
- Lecture 45 - Faradays law and its application-II
- Lecture 46 - Displacement current
- Lecture 47 - Maxwell's equation
- Lecture 48 - Wave propagation
- Lecture 49 - Solution of Helmholtz equation
- Lecture 50 - Uniform plane waves
- Lecture 51 - Polarization and Poynting Vector
- Lecture 52 - Wave reflections (Normal incidence)
- Lecture 53 - Waves in imperfect dielectrics and Good conductors
- Lecture 54 - Skin depth/effect
- Lecture 55 - Oblique incidence of waves
- Lecture 56 - Oblique incidence of waves (Continued...)
- Lecture 57 - Transmission line
- Lecture 58 - Transmission line model
- Lecture 59 - Steady state sinusoidal response of T-line-I
- Lecture 60 - Steady state sinusoidal response of T-line-II
- Lecture 61 - Steady state sinusoidal response of T-line-II and Smith chart
- Lecture 62 - Application of smith chart-I
- Lecture 63 - Application of smith chart-II
- Lecture 64 - Impedance matching
- Lecture 65 - Transients on Transmission line-I
- Lecture 66 - Transients on Transmission line-II
- Lecture 67 - Pulse on Transmission line
- Lecture 68 - Capacitive termination in Transmission line

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

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- Lecture 69 - Waveguide
- Lecture 70 - Waveguide Analysis
- Lecture 71 - TM modes in Waveguide
- Lecture 72 - Rectangular waveguide
- Lecture 73 - Rectangular waveguide
- Lecture 74 - Waveguide
- Lecture 75 - Waveguide losses
- Lecture 76 - Dielectric Waveguide
- Lecture 77 - Dielectric Waveguide (Continued...)
- Lecture 78 - Radiation and Antenna
- Lecture 79 - Hertzian Dipole Antenna
- Lecture 80 - Hertzian Dipole Antenna (Continued...)
- Lecture 81 - Quasi-statistics-I
- Lecture 82 - Quasi-statistics-II
- Lecture 83 - Long wire Antenna
- Lecture 84 - Group velocity and Phase velocity
- Lecture 85 - Numerical solution of Laplace's equation

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

NPTEL Video Course - Electrical Engineering - NOC:Principles of Communication - Part 1

Subject Co-ordinator - Prof. Aditya K. Jagannatham

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Basics - Definition of Energy and Power of Signals
- Lecture 2 - Frequency Domain Representation and Introduction to Discrete Fourier Series
- Lecture 3 - Discrete Fourier Series Example and Parseval's Theorem for Periodic Signals
- Lecture 4 - Fourier Transform (FT), Inverse Fourier Transform (IFT) of Continuous Signals, Example of FT of P
- Lecture 5 - Modulation Property of Fourier Transform, Dirac Delta or Unit Impulse Function - Definition and F
- Lecture 6 - Duality Property of Fourier Transform and Introduction to Linear Time Invariant (LTI) Systems
- Lecture 7 - Transmission of Signal through Linear Time Invariant (LTI) Systems and Cross- Correlation of Sign
- Lecture 8 - Auto-Correlation of Signal and Energy Spectral Density (ESD)
- Lecture 9 - Example for Auto-Correlation of Signal and Energy Spectral Density (ESD)
- Lecture 10 - Introduction to Amplitude Modulation (AM), Modulation Index, Envelope Distortion and Over Modula
- Lecture 11 - Spectrum of Amplitude Modulated(AM) Signals and Introduction to Envelope Detection
- Lecture 12 - Envelope Detection for Amplitude Modulated (AM) Signals and Time Constant for Capacitor in Envel
- Lecture 13 - Power of Amplitude Modulated (AM) Signals and Power Efficiency of AM Signals
- Lecture 14 - Double Sideband (DSB) Suppressed Carrier (SC) Modulation, Spectrum of DSB-SC Signals and Coheren
- Lecture 15 - Double Sideband(DSB) Suppressed Carrier (SC) Demodulation, Non-coherent demodulation, Impact of
- Lecture 16 - Carrier Phase Offset Example for Double Sideband (DSB) Suppressed Carrier (SC) Demodulation- Wir
- Lecture 17 - Phase Synchronization using Costas Receiver for Double Sideband (DSB) Suppressed Carrier (SC) De
- Lecture 18 - Introduction to Quadrature Carrier Multiplexing (QCM) and Demodulation of QCM Signals.
- Lecture 19 - Introduction to Single Sideband (SSB) Modulation
- Lecture 20 - Generation of Single Sideband (SSB) Modulation Signals through Frequency Discrimination
- Lecture 21 - Frequency Domain Description of Hilbert Transform  $\hat{A}$  Fourier Spectrum of the Hilbert Transformer
- Lecture 22 - Time Domain Description of Hilbert Transform  $\hat{A}$  Impulse Response of the Hilbert Transformer
- Lecture 23 - Phase Shifting Method for Generation of Single Sideband (SSB) Modulated Signals based on Hilbert
- Lecture 24 - Complex Pre-Envelope and Complex Envelope of Passband Signals
- Lecture 25 - Complex Pre- Envelope and Complex Envelope of QCM (Quadrature Carrier Modulated) Signals
- Lecture 26 - Introduction to Vestigial Side Band(VSB) Modulation and Non- Ideal Filtering, Spectral Efficiency
- Lecture 27 - Properties of Vestigial Side Band Filter for Reconstruction of Message Signal without Distortion
- Lecture 28 - Introduction to Angle Modulation, Description of Phase Modulation (PM) and Frequency Modulation
- Lecture 29 - Frequency Modulation (FM) with Sinusoidal Modulation Signal and Pictorial Examples, Insights of

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

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- Lecture 30 - Indirect Method for Generation of FM Signals - Generation of Narrowband FM Signal
- Lecture 31 - Indirect Method for Generation of FM Signals - Generation of Wideband FM Signal through Frequency Modulation
- Lecture 32 - Spectrum of Frequency Modulated (FM) Signals
- Lecture 33 - Bandwidth of Frequency Modulated (FM) Signals - Carson's Rule
- Lecture 34 - Demodulation of Frequency Modulated (FM) Signals, Condition of Envelope Detection
- Lecture 35 - Analog to Digital Conversion of Signals and Introduction to Sampling
- Lecture 36 - Spectrum of Sampled Signal, Aliasing and Nyquist Sampling Theorem
- Lecture 37 - Ideal Impulse Train Sampling, Reconstruction of Original Signal from Samples, Sinc Interpolation
- Lecture 38 - Introduction to Pulse Amplitude Modulation (PAM), Sample and Hold, Flat Top Sampling
- Lecture 39 - Pulse Amplitude Modulation (PAM), Spectrum of PAM Signal, Reconstruction of Original Signal from Samples
- Lecture 40 - Introduction to Quantization, Uniform Quantizer, Mid-Tread Quantizer
- Lecture 41 - Quantization, Mid-Rise Quantizer, PDF and Power of Quantization Noise, Quantization Noise Power
- Lecture 42 - Introduction to Lloyd-Max Quantization Algorithm, Optimal Quantizer Design
- Lecture 43 - Lloyd-Max Quantization Algorithm, Iterative Computation of Optimal Quantization Levels and Intervals
- Lecture 44 - Companding for Non-Uniform Quantization,  $\mu$ -law Compressor, A-law Compressor
- Lecture 45 - Introduction to Delta Modulation, One-bit Quantizer
- Lecture 46 - Signal Reconstruction in Delta Modulation, Schematic Diagrams, Slope Overload Distortion and Granular Noise
- Lecture 47 - Differential Pulse Coded Modulation (DPCM), DPCM Signal Reconstruction and Schematic Diagram
- Lecture 48 - Frequency Mixing and Translation in Communication Systems, Heterodyne and Super Heterodyne Receivers
- Lecture 49 - Frequency Translation and Super Heterodyne Receivers, Problem of Image Frequency
- Lecture 50 - Frequency Division Multiplexing (FDM), Carrier Spacing in FDM
- Lecture 51 - Time Division Multiplexing (TDM), Operation of TDM, Sample Spacing in TDM
- Lecture 52 - Bandwidth Requirements for Time Division Multiplexing (TDM), The T1 TDM System

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

NPTEL Video Course - Electrical Engineering - NOC:An Introduction to Coding Theory

Subject Co-ordinator - Dr. Adrish Banerjee

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction to Error Control Coding - I  
Lecture 2 - Introduction to Error Control Coding - II  
Lecture 3 - Introduction to Error Control Coding - III  
Lecture 4 - Introduction to Linear Block Codes, Generator Matrix and Parity Check Matrix  
Lecture 5 - Syndrome, Error Correction and Error Detection  
Lecture 6 - Problem Solving Session - I  
Lecture 7 - Decoding of Linear Block Codes  
Lecture 8 - Distance Properties of Linear Block Codes - I  
Lecture 9 - Distance Properties of Linear Block Codes - II  
Lecture 10 - Problem Solving Session - II  
Lecture 11 - Some Simple Linear Block Codes - I  
Lecture 12 - Some Simple Linear Block Codes - II  
Lecture 13 - Bounds on the Size of a Code  
Lecture 14 - Problem Solving Session - III  
Lecture 15 - Introduction to Convolutional Codes - I  
Lecture 16 - Introduction to Convolutional Codes - II  
Lecture 17 - Convolutional Codes  
Lecture 18 - Convolutional Codes  
Lecture 19 - Decoding of Convolutional Codes - I  
Lecture 20 - Decoding of Convolutional Codes - II  
Lecture 21 - Problem solving session - IV  
Lecture 22 - Problem solving session - V  
Lecture 23 - Performance Bounds for Convolutional Codes  
Lecture 24 - Low Density Parity Check Codes  
Lecture 25 - Decoding of Low Density Parity Check Codes - I  
Lecture 26 - Decoding of Low Density Parity Check Codes - II  
Lecture 27 - Turbo Codes  
Lecture 28 - Turbo Decoding  
Lecture 29 - Problem Solving Sessions - VI

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

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- Lecture 30 - Distance Properties of Turbo Codes
- Lecture 31 - Convergence of Turbo Codes
- Lecture 32 - Automatic Repeat reQuest (ARQ) Schemes
- Lecture 33 - Applications of Linear Codes



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

NPTEL Video Course - Electrical Engineering - NOC:Principles of Communication Systems - Part II

Subject Co-ordinator - Prof. Aditya K. Jagannatham

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Digital Communication Systems
- Lecture 2 - Spectrum of Transmitted Digital Communication Signal and Wide Sense Stationarity
- Lecture 3 - Spectrum of Transmitted Digital Communication Signal, Autocorrelation Function and Power Spectral Density
- Lecture 4 - Spectrum of Transmitted Digital Communication Signal, Relation to Energy Spectral Density and Intensity
- Lecture 5 - Additive White Gaussian Noise (AWGN) Properties, Gaussian Noise and White Noise
- Lecture 6 - Structure of Digital Communication Receiver, Receiver Filter and Signal-to-Noise Power Ratio (SNR)
- Lecture 7 - Digital Communication Receiver, Noise Properties and Output Noise Power
- Lecture 8 - Digital Communication Receiver, Optimal SNR and Matched Filter
- Lecture 9 - Probability of Error in Digital Communication and Probability Density Functions of Output
- Lecture 10 - Probability of Error in Digital Communication, Optimal Decision Rule and Gaussian Q function
- Lecture 11 - Introduction to Binary Phase Shift Keying (BPSK) Modulation, Optimal Decision Rule and Probability of Error
- Lecture 12 - Introduction to Amplitude Shift Keying (ASK) Modulation
- Lecture 13 - Optimal Decision Rule for Amplitude Shift Keying (ASK), Bit Error Rate (BER) and Comparison with BPSK
- Lecture 14 - Introduction to Signal Space Concept and Orthonormal Basis Signals
- Lecture 15 - Introduction to Frequency Shift Keying (FSK)
- Lecture 16 - Optimal Decision Rule for FSK, Bit Error Rate (BER) and Comparison with BPSK, ASK
- Lecture 17 - Introduction to Quadrature Phase Shift Keying (QPSK)
- Lecture 18 - Waveforms of Quadrature Phase Shift Keying (QPSK)
- Lecture 19 - Matched Filtering, Bit Error Rate and Symbol Error Rate for Quadrature Phase Shift Keying (QPSK)
- Lecture 20 - Introduction to M-ary PAM (Pulse Amplitude Modulation), Average Symbol Power and Decision rules
- Lecture 21 - M-ary PAM (Pulse Amplitude Modulation) -Part-II, Optimal Decision Rule and Probability of Error
- Lecture 22 - M-ary QAM (Quadrature Amplitude Modulation) Part-I, Introduction, Transmitted Waveform and Average Symbol Power
- Lecture 23 - M-ary QAM (Quadrature Amplitude Modulation) - Part-II, Optimal Decision Rule, Probability of Error
- Lecture 24 - M-ary PSK (Phase Shift Keying) Part-I, Introduction , Transmitted Waveform and Constellation Diagram
- Lecture 25 - M-ary PSK (Phase Shift Keying) - Part-II, Optimal Decision Rule, Nearest Neighbor Criterion and Probability of Error
- Lecture 26 - Introduction to Information Theory, Relevance of Information Theory and Characterization of Information
- Lecture 27 - Definition of Entropy, Average of Information / Uncertainty of source and Properties of Entropy
- Lecture 28 - Entropy Example- Binary Source Maximum and Minimum Entropy of Binary Source
- Lecture 29 - Maximum Entropy of Source with M-ary Alphabet, Concave/Convex Functions and Jensens Inequality

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

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- Lecture 30 - Joint Entropy , Definition of Joint Entropy of Two Sources and Simple Examples for Joint Entropy
- Lecture 31 - Properties of Joint Entropy and Relation between Joint Entropy and Marginal Entropies
- Lecture 32 - Conditional Entropy, Example of Conditional Entropy and Properties of Conditional Entropy
- Lecture 33 - Mutual Information, Diagrammatic Representation and Properties of Mutual Information
- Lecture 34 - Simple Example of Mutual Information and Practical Example of Mutual Information-Binary Symmetric
- Lecture 35 - Channel Capacity, Implications of Channel Capacity, Claude E. Shannon- Father of Information Theory
- Lecture 36 - Differential Entropy and Example for Uniform Probability Density function
- Lecture 37 - Differential Entropy of Gaussian Source and Insights
- Lecture 38 - Joint Conditional/ Differential Entropies and Mutual Information
- Lecture 39 - Capacity of Gaussian channel - Part I
- Lecture 40 - Capacity of Gaussian Channel - Part-II, Practical Implications and Maximum rate in bits/sec
- Lecture 41 - Introduction to Source Coding and Data Compression, Variable Length codes and Unique Decodability
- Lecture 42 - Uniquely Decodable Codes, Prefix-free code, Instantaneous Code and Average Code length
- Lecture 43 - Binary Tree Representation of Code, Example and Kraft Inequality
- Lecture 44 - Lower Bound on Average Code Length and Kullback-Leibler Divergence
- Lecture 45 - Optimal Code length, Constrained Optimization and Morse Code Example
- Lecture 46 - Approaching Lower Bound on Average code length and Block Coding
- Lecture 47 - Huffman Code, Algorithm, Example and Average Code Length
- Lecture 48 - Introduction to channel coding, Rate of Code, Repetition Code and Hamming Distance
- Lecture 49 - Introduction to Convolutional Codes, Binary Field Arithmetic and Linear Codes
- Lecture 50 - Example of Convolutional Code Output and Convolution Operation for Code generation
- Lecture 51 - Matrix Representation of Convolutional Codes, Generator Matrix, Transform Domain Representation
- Lecture 52 - State Diagram Representation of Convolutional Code, State transitions and Example of Code Generation
- Lecture 53 - Trellis Representation of Convolutional Code and Valid Code Words
- Lecture 54 - Decoding of the Convolutional Code, Minimum Hamming distance and Maximum Likelihood Codeword Estimation
- Lecture 55 - Principle of Decoding of Convolutional code
- Lecture 56 - Viterbi Decoder for Maximum Likelihood Decoding of Convolutional Code Using Trellis Representation

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

NPTEL Video Course - Electrical Engineering - NOC:Applied Engineering Electromagnetics

Subject Co-ordinator - Dr. Pradeep Kumar K

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Applied Electromagnetics
- Lecture 2 - Introduction to Transmission lines
- Lecture 3 - Sinusoidal waves on Transmission lines
- Lecture 4 - Terminating T-lines
- Lecture 5 - Circuit parameters of a T-line
- Lecture 6 - Lossy Transmission lines and primary constants
- Lecture 7 - When to apply T-line Theory?
- Lecture 8 - Standing Waves on T-lines
- Lecture 9 - Lumped equivalent circuits of T-lines
- Lecture 10 - Impedance transformation and power flow on T-lines
- Lecture 11 - Graphical aid
- Lecture 12 - Smith chart applications
- Lecture 13 - Further applications of Smith chart - Part 1
- Lecture 14 - Further applications of Smith chart - Part 2
- Lecture 15 - Impedance matching techniques - Part 1
- Lecture 16 - Impedance matching techniques - Part 2
- Lecture 17 - Impedance matching techniques - Part 3
- Lecture 18 - T-lines in time domain
- Lecture 19 - Further examples of use of lattice diagrams
- Lecture 20 - High-speed digital signal propagation on T-lines
- Lecture 21 - Transient analysis with reactive termination and Time-domain reflectometry
- Lecture 22 - Fault detection using TDR
- Lecture 23 - Why Electromagnetics?
- Lecture 24 - Rectangular coordinate systems
- Lecture 25 - Cylindrical coordinate systems
- Lecture 26 - Review of vector fields and Gradient
- Lecture 27 - Divergence, Curl, and Laplacian operations
- Lecture 28 - Towards Maxwells equations - Part 1
- Lecture 29 - Towards Maxwells equations - Part 2

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

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- Lecture 30 - Faradays law
- Lecture 31 - Completing Maxwells equations and Boundary conditions
- Lecture 32 - Boundary conditions for Electromagnetic fields
- Lecture 33 - Electrostatics-I
- Lecture 34 - Electrostatics-II
- Lecture 35 - Electrostatics-III
- Lecture 36 - Electrostatics-IV
- Lecture 37 - Magnetostatic fields-I
- Lecture 38 - Magnetostatic fields-II
- Lecture 39 - Inductance calculations
- Lecture 40 - From Maxwells equations to uniform plane waves
- Lecture 41 - Plane wave propagation in lossless dielectric media
- Lecture 42 - Polarization of plane waves
- Lecture 43 - Can an Ideal capacitor exist?
- Lecture 44 - Skin effect in conductors
- Lecture 45 - Skin effect in round wires
- Lecture 46 - Finite difference method
- Lecture 47 - Reflection of uniform plane waves
- Lecture 48 - Application
- Lecture 49 - Oblique incidence of plane waves
- Lecture 50 - Total internal reflection
- Lecture 51 - Application
- Lecture 52 - Application
- Lecture 53 - Introduction to waveguides
- Lecture 54 - Rectangular waveguides
- Lecture 55 - Attenuation and Dispersion in rectangular waveguides
- Lecture 56 - Planar optical waveguides
- Lecture 57 - Application
- Lecture 58 - Application
- Lecture 59 - Mach-Zehnder Modulator
- Lecture 60 - Wave Propagation in Anisotropic Medium
- Lecture 61 - Wave Propagation in Ferrites
- Lecture 62 - Magnetic Vector Potential - Part 1
- Lecture 63 - Magnetic Vector Potential - Part 2
- Lecture 64 - Fields of a Dipole Antenna
- Lecture 65 - Antenna Parameters and Long wire Antenna
- Lecture 66 - Friis Transmission Formula

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

NPTEL Video Course - Electrical Engineering - NOC:Principles of Signals and Systems

Subject Co-ordinator - Prof. Aditya K. Jagannatham

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Principles of Signals and Systems- Introduction to Signals and Systems, Signal Classification - C
- Lecture 2 - Analog and Digital Signals
- Lecture 3 - Energy and Power Signals
- Lecture 4 - Real Exponential Signals
- Lecture 5 - Memory/Memory-less and Causal/Non-Causal Systems
- Lecture 6 - Properties of Linear Systems
- Lecture 7 - Example Problems - 1
- Lecture 8 - Example Problems - 2
- Lecture 9 - Example Problems - 3
- Lecture 10 - Properties and Analysis of LTI Systems - I
- Lecture 11 - Properties and Analysis of LTI Systems - II
- Lecture 12 - Properties and Analysis of LTI Systems - III
- Lecture 13 - Properties of Discrete Time LTI Systems
- Lecture 14 - Example Problems LTI Systems - I
- Lecture 15 - Example Problems LTI Systems - II
- Lecture 16 - Example Problems DT-LTI Systems
- Lecture 17 - Laplace Transform
- Lecture 18 - Laplace Transform Properties - I
- Lecture 19 - Laplace Transform Properties - II
- Lecture 20 - Laplace Transform of LTI Systems
- Lecture 21 - Laplace Transform Example Problems - I
- Lecture 22 - Laplace Transform Example Problems - II
- Lecture 23 - Laplace Transform of RL, RC Circuit
- Lecture 24 - Z-Transform
- Lecture 25 - Z-Transform Properties - I
- Lecture 26 - Z-Transform Properties - II
- Lecture 27 - Z-Transform of LTI Systems
- Lecture 28 - Z-Transform Examples - I
- Lecture 29 - Z-Transform Examples - II

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

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- Lecture 30 - Z-Transform Examples - III
- Lecture 31 - Z-Transform Examples - IV
- Lecture 32 - Inverse Z-Transform
- Lecture 33 - Fourier Analysis Introduction
- Lecture 34 - Complex Exponential and Trigonometric FS
- Lecture 35 - Conditions for Existence of FS
- Lecture 36 - Fourier Transform (FT) Introduction
- Lecture 37 - Properties of Fourier Transform - I
- Lecture 38 - Properties of Fourier Transform - II
- Lecture 39 - Fourier Transform - Parseval's Relation
- Lecture 40 - Fourier Transform of LTI Systems
- Lecture 41 - FT- Ideal and Non-Ideal Filters
- Lecture 42 - Fourier Analysis Examples - I
- Lecture 43 - Fourier Analysis Examples - II
- Lecture 44 - Fourier Analysis Examples - III
- Lecture 45 - Fourier Analysis Examples - IV
- Lecture 46 - Fourier Analysis Examples - V
- Lecture 47 - Fourier Analysis Examples - VI
- Lecture 48 - Fourier Analysis Bode Plot - I
- Lecture 49 - Fourier Analysis Bode Plot - II
- Lecture 50 - Fourier Transform Examples
- Lecture 51 - Fourier Transform Problems
- Lecture 52 - Sampling
- Lecture 53 - Sampling
- Lecture 54 - Fourier Analysis of Discrete Time Signals and Systems - Introduction
- Lecture 55 - Fourier Analysis of Discrete Time Signals - Duality, Parseval's Theorem
- Lecture 56 - Discrete Time Fourier Transform
- Lecture 57 - Discrete Time Fourier Transform
- Lecture 58 - Discrete Time Fourier Transform
- Lecture 59 - DTFT
- Lecture 60 - Discrete Fourier Transform - Definition, Inverse DFT, Relation between DFT and DFS, Relation bet
- Lecture 61 - Discrete Fourier Transform
- Lecture 62 - Example Problems
- Lecture 63 - Example Problems
- Lecture 64 - DTFT Example Problems - III
- Lecture 65 - DTFT Example Problems - IV
- Lecture 66 - DTFT Example Problems - V
- Lecture 67 - DFT Example Problems - I
- Lecture 68 - Example Problems

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

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- Lecture 69 - Group/Phase Delay - Part I
- Lecture 70 - Group/Phase Delay - Part II
- Lecture 71 - IIR Filter Structures
- Lecture 72 - IIR Filter Structures
- Lecture 73 - IIR Filter Structures
- Lecture 74 - IIR Filter Structures
- Lecture 75 - IIR Filter

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

NPTEL Video Course - Electrical Engineering - NOC:Applied Optimization for Wireless, Machine Learning, Big Data

Subject Co-ordinator - Prof. Aditya K. Jagannatham

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Vectors and Matrices - Linear Independence and Rank
- Lecture 2 - Eigenvectors and Eigenvalues of Matrices and their Properties
- Lecture 3 - Positive Semidefinite (PSD) and Positive Definite (PD) Matrices and their Properties
- Lecture 4 - Inner Product Space and its Properties
- Lecture 5 - Inner Product Space and its Properties
- Lecture 6 - Properties of Norm, Gaussian Elimination and Echelon form of matrix
- Lecture 7 - Gram Schmidt Orthogonalization Procedure
- Lecture 8 - Null Space and Trace of Matrices
- Lecture 9 - Eigenvalue Decomposition of Hermitian Matrices and Properties
- Lecture 10 - Matrix Inversion Lemma (Woodbury identity)
- Lecture 11 - Introduction to Convex Sets and Properties
- Lecture 12 - Affine Set Examples and Application
- Lecture 13 - Norm Ball and its Practical Applications
- Lecture 14 - Ellipsoid and its Practical Applications
- Lecture 15 - Norm Cone, Polyhedron and its Applications
- Lecture 16 - Applications
- Lecture 17 - Positive Semi Definite Cone And Positive Semi Definite (PSD) Matrices
- Lecture 18 - Introduction to Affine functions and examples
- Lecture 19 - norm balls and Matrix properties
- Lecture 20 - Inverse of a Positive Definite Matrix
- Lecture 21 - Example Problems
- Lecture 22 - Problems on Convex Sets (Continued...)
- Lecture 23 - Introduction to Convex and Concave Functions
- Lecture 24 - Properties of Convex Functions with examples
- Lecture 25 - Test for Convexity
- Lecture 26 - Application
- Lecture 27 - Jensen's Inequality and Practical Application
- Lecture 28 - Jensen's Inequality application
- Lecture 29 - Properties of Convex Functions

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

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- Lecture 30 - Conjugate Function and Examples to prove Convexity of various Functions
- Lecture 31 - Examples on Operations Preserving Convexity
- Lecture 32 - Examples on Test for Convexity, Quasi-Convexity
- Lecture 33 - Examples on Convex Functions
- Lecture 34 - Practical Application
- Lecture 35 - Practical Application
- Lecture 36 - Practical Application
- Lecture 37 - Practical Application
- Lecture 38 - Practical Application
- Lecture 39 - Practical Application
- Lecture 40 - Practical Application
- Lecture 41 - Linear modeling and Approximation Problems
- Lecture 42 - Geometric Intuition for Least Squares
- Lecture 43 - Practical Application
- Lecture 44 - Practical Application
- Lecture 45 - Least Norm Signal Estimation
- Lecture 46 - Regularization
- Lecture 47 - Convex Optimization Problem representation
- Lecture 48 - Linear Program Practical Application
- Lecture 49 - Stochastic Linear Program, Gaussian Uncertainty
- Lecture 50 - Practical Application
- Lecture 51 - Practical Application
- Lecture 52 - Practical Application
- Lecture 53 - Practical Application
- Lecture 54 - Practical Application
- Lecture 55 - Practical Application
- Lecture 56 - Practical Application
- Lecture 57 - Practical Application- Orthogonal Matching Pursuit (OMP) algorithm for Compressive Sensing
- Lecture 58 - Example Problem
- Lecture 59 - Practical Application
- Lecture 60 - Practical Application of Machine Learning and Artificial Intelligence
- Lecture 61 - Practical Application
- Lecture 62 - Practical Application
- Lecture 63 - Concept of Duality
- Lecture 64 - Relation between optimal value of Primal and Dual Problems, concepts of Duality gap and Strong D
- Lecture 65 - Example problem on Strong Duality
- Lecture 66 - Karush-Kuhn-Tucker (KKT) conditions
- Lecture 67 - Application of KKT condition
- Lecture 68 - Optimal MIMO Power allocation (Waterfilling)-II

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

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- Lecture 69 - Example problem on Optimal MIMO Power allocation (Waterfilling)
- Lecture 70 - Linear objective with box constraints, Linear Programming
- Lecture 71 - Example Problems II
- Lecture 72 - Examples on Quadratic Optimization
- Lecture 73 - Examples on Duality
- Lecture 74 - Examples on Duality
- Lecture 75 - Semi Definite Program (SDP) and its application
- Lecture 76 - Application
- Lecture 77 - Introduction to big Data
- Lecture 78 - Matrix Completion Problem in Big Data
- Lecture 79 - Matrix Completion Problem in Big Data

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

NPTEL Video Course - Electrical Engineering - NOC:Fiber-Optic Communication Systems and Techniques

Subject Co-ordinator - Dr. Pradeep Kumar K

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Overview of fiber-optic communication systems
- Lecture 2 - Review of Maxwell's equations
- Lecture 3 - Uniform plane waves (UWPs) in free-space
- Lecture 4 - Properties of UWPs (propagation constant, polarization, and Poynting vector)
- Lecture 5 - Boundary conditions and reflection from a PEC
- Lecture 6 - Obliquely incident waves-I (TE and TM waves, Snell's laws)
- Lecture 7 - Obliquely incident waves-II (Reflection and transmission coefficients, Brewster angle)
- Lecture 8 - Total internal reflection
- Lecture 9 - Ray theory of dielectric slab waveguides
- Lecture 10 - Transverse resonance condition for slab waveguides
- Lecture 11 - Introduction to optical fibers
- Lecture 12 - Ray theory of light propagation in optical fibers
- Lecture 13 - Concept of waveguide modes
- Lecture 14 - Systematic procedure to obtain modes of a waveguide
- Lecture 15 - Systematic analysis of parallel plate metallic waveguide
- Lecture 16 - Systematic analysis of dielectric slab waveguides
- Lecture 17 - Further discussion on slab waveguides
- Lecture 18 - Modal analysis of step index optical fiber
- Lecture 19 - Properties of modes of step-index optical fiber - I
- Lecture 20 - Properties of modes of step-index optical fiber - II
- Lecture 21 - Linearly polarized modes
- Lecture 22 - Attenuation and power loss in fibers
- Lecture 23 - Introduction to dispersion in fibers
- Lecture 24 - Mathematical modelling of dispersion
- Lecture 25 - Pulse propagation equation and its solution
- Lecture 26 - Pre-chirped pulses and Inter and Intra-modal dispersion in optical fibers
- Lecture 27 - Beam Propagation Method
- Lecture 28 - Polarization Effects on Pulse Propagation
- Lecture 29 - Modes in Optical Fibres and Pulse Propagation in Optical Fibres

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

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- Lecture 30 - Graded Index Fibers
- Lecture 31 - Light Sources, Detectors and Amplifiers
- Lecture 32 - Basics of Lasers-I (Structure of Lasers, Process of Photon Emission)
- Lecture 33 - Basics of Lasers-II (Einstein's Theory of Radiation)
- Lecture 34 - Basics of Lasers-III (Population Inversion and Rate Equation for Lasers)
- Lecture 35 - Basic Properties of Semiconductor Laser-I (Energy Gap, Intrinsic and Extrinsic Semiconductors)
- Lecture 36 - Basic Properties of Semiconductor Laser-II (Fermi Level)
- Lecture 37 - Optical Properties of Semiconductors-I (Direct Bandgap and Indirect Bandgap, Density of States)
- Lecture 38 - Optical Properties of Semiconductors-II (Gain, Absorption, Recombination rate) Homojunction Laser
- Lecture 39 - Double Heterostructure Lasers, Introduction to Quantum Well Lasers
- Lecture 40 - Semiconductor Optical Amplifier
- Lecture 41 - Erbium-doped fiber amplifier
- Lecture 42 - Photodetectors
- Lecture 43 - Noise in Photodetectors
- Lecture 44 - Introduction to WDM components
- Lecture 45 - Couplers, Circulators, FRM and Filters
- Lecture 46 - Filter, MUX/DEMUX, Diffraction grating (FBG and Long period grating)
- Lecture 47 - Optical Modulators-I (Current modulation)
- Lecture 48 - Optical Modulators-II (Electro-optic modulators)
- Lecture 49 - Review of Communication Concepts-I (Deterministic and Random Signals, Baseband and Passband Signals)
- Lecture 50 - Review of Communication Concepts-II (Signal and vectors, Signal energy, Orthonormal basis functions)
- Lecture 51 - Intensity modulation/ Direct Detection
- Lecture 52 - BER discussion for OOK systems
- Lecture 53 - Higher order modulation and Coherent Receiver
- Lecture 54 - Coherent receiver for BPSK systems and BER calculation
- Lecture 55 - Recovering Polarization
- Lecture 56 - DSP algorithms for Chromatic dispersion mitigation
- Lecture 57 - DSP algorithms for Carrier phase estimation - I
- Lecture 58 - DSP algorithms for Carrier phase estimation - II
- Lecture 59 - Nonlinear effects in fiber
- Lecture 60 - Four wave mixing, Loss measurement, Dispersion measurement
- Lecture 61 - Lab Demonstration (Laser diode characteristics, Loss measurement, Optical Intensity Modulation)

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

NPTEL Video Course - Electrical Engineering - NOC:Electromagnetic Waves in Guided and Wireless Media

Subject Co-ordinator - Dr. Pradeep Kumar K

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction and Types of Transmission Lines
- Lecture 2 - Distributed Circuit Model of Uniform Transmission Line
- Lecture 3 - Voltage and Current Equation of the Transmission line
- Lecture 4 - Sinusoidal Excitation of Transmission Line (Propagation constant, Characteristic Impedance)
- Lecture 5 - Properties of Transmission Line (Reflection Coefficient, Input Impedance, Standing Wave Ratio)
- Lecture 6 - Power Calculations and Introduction to Smith Chart
- Lecture 7 - Smith Chart
- Lecture 8 - Additional Applications of Smith Chart
- Lecture 9 - Time domain Analysis of Transmission Line - I
- Lecture 10 - Time domain Analysis of Transmission Line - II
- Lecture 11 - Usage of Lattice Diagrams
- Lecture 12 - TDR analysis of Transmission Lines
- Lecture 13 - Introduction to Propagation of Electromagnetic Waves
- Lecture 14 - Uniform Plane Waves - I
- Lecture 15 - Uniform Plane Waves - II
- Lecture 16 - Poynting Vector, Average Power, Polarization
- Lecture 17 - Uniform Plane Waves in Lossy Medium
- Lecture 18 - Normal Incidence of Plane Waves
- Lecture 19 - Oblique Incidence of Plane Waves - I
- Lecture 20 - Oblique Incidence of Plane Waves - II
- Lecture 21 - Total Internal Reflection
- Lecture 22 - Slab Waveguides
- Lecture 23 - Optical Fibers
- Lecture 24 - Parallel Plate Waveguides
- Lecture 25 - Rectangular Waveguides
- Lecture 26 - Modes of Rectangular Waveguides
- Lecture 27 - Waveguides summary and Introduction to Radiation
- Lecture 28 - Solution to Electric Scalar Potential and Magnetic Vector Potential Equations
- Lecture 29 - Further discussion on Magnetic Vector Potential and Elementary Hertzian Dipole

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

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- Lecture 30 - Near field and Far-field Antenna and Properties of Antennas
- Lecture 31 - Linear antenna - I
- Lecture 32 - Linear antenna - II and Properties of Transmitting and Receiving Antenna
- Lecture 33 - Friis Transmission Formula
- Lecture 34 - Antenna Array
- Lecture 35 - Wireless Channel
- Lecture 36 - Further discussion on Wireless Channel Modelling
- Lecture 37 - Diffraction - I
- Lecture 38 - Diffraction - II
- Lecture 39 - Distribution of Laser Beam
- Lecture 40 - Interference (Double slit experiment, Fabry Perot Interferometer)
- Lecture 41 - Summary

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

NPTEL Video Course - Electrical Engineering - NOC:Basic Electric Circuits

Subject Co-ordinator - Prof. Ankush Sharma

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Basic Concepts
- Lecture 2 - Sinusoids and Phasors
- Lecture 3 - Circuit Elements - Part 1
- Lecture 4 - Circuit Elements - Part 2
- Lecture 5 - AC Power Analysis
- Lecture 6 - RMS Voltage and Current
- Lecture 7 - Topology
- Lecture 8 - Star-Delta Transformation and Mesh Analysis
- Lecture 9 - Mesh Analysis.
- Lecture 10 - Nodal Analysis
- Lecture 11 - Linearity Property and Superposition Theorem
- Lecture 12 - Source Transformation
- Lecture 13 - Duality
- Lecture 14 - Thevenin's Theorem - 1
- Lecture 15 - Thevenin's Theorem - 2
- Lecture 16 - Norton's Theorem - 1
- Lecture 17 - Norton's Theorem - 2
- Lecture 18 - Maximum Power Transfer Theorem - 1
- Lecture 19 - Maximum Power Transfer Theorem - 2
- Lecture 20 - Reciprocity and Compensation Theorem
- Lecture 21 - First Order RC Circuits
- Lecture 22 - First Order RL Circuits
- Lecture 23 - Singularity Functions
- Lecture 24 - Step Response of RC and RL Circuits
- Lecture 25 - Second Order Response
- Lecture 26 - Step Response of Second Order Circuits-First Order and Second Order Circuits (Continued...)
- Lecture 27 - Step Response of Parallel RLC Circuit-First Order and Second Order Circuits (Continued...)
- Lecture 28 - Definition of the Laplace Transform
- Lecture 29 - Properties of the Laplace Transform

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

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- Lecture 30 - Inverse Laplace Transform
- Lecture 31 - Laplace Transform of Circuit Elements
- Lecture 32 - Transfer Function
- Lecture 33 - Convolution Integral
- Lecture 34 - Graphical Approach of Convolution Integral
- Lecture 35 - Network Stability and Network Synthesis
- Lecture 36 - Impedance Parameters
- Lecture 37 - Admittance Parameters
- Lecture 38 - Hybrid Parameters
- Lecture 39 - Transmission Parameters
- Lecture 40 - Interconnection of Networks
- Lecture 41 - Nodal and Mesh Analysis
- Lecture 42 - Superposition Theorem and Source Transformation
- Lecture 43 - Thevenin's, Norton's and, Maximum Power Transfer Theorem
- Lecture 44 - Magnetically Coupled Circuits
- Lecture 45 - Energy in Coupled Circuits and Ideal Transformer
- Lecture 46 - Ideal Transformer and Introduction to Three-Phase Circuits
- Lecture 47 - Balanced Three-Phase Connections
- Lecture 48 - Balanced Wye-Delta and Delta-Delta Connections
- Lecture 49 - Balanced Delta-Wye Connection and Power in Balanced Three-Phase System
- Lecture 50 - Unbalanced Three-Phase System and Three-Phase Power Measurement
- Lecture 51 - Introduction to Graphical Models
- Lecture 52 - State Equations
- Lecture 53 - State Diagram
- Lecture 54 - State Transition Matrix
- Lecture 55 - State Variable Method to Circuit Analysis
- Lecture 56 - Characteristic Equation, Eigenvalues, and Eigenvectors-State Variable Analysis (Continued...)
- Lecture 57 - Modeling of Mechanical Systems
- Lecture 58 - Modeling of The Rotational Motion of Mechanical Systems
- Lecture 59 - Modeling of Electrical Systems
- Lecture 60 - Solving Analogous Systems



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

NPTEL Video Course - Electrical Engineering - NOC:Fundamentals of Electric Drives

Subject Co-ordinator - Prof. Shyama Prasad Das

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Electric Drives
- Lecture 2 - Dynamics of Electric Drives, Four Quadrant Operation, Equivalent Drive Parameters
- Lecture 3 - Equivalent Drive Parameters, Friction Components, Nature of Load Torque
- Lecture 4 - Steady State Stability, Load Equalization
- Lecture 5 - Load Equalization, Characteristics of DC Motor
- Lecture 6 - Speed Torque Characteristics of Separately Excited DC Motor and Series DC Motor
- Lecture 7 - Field Control of Series Motor, Motoring and Braking of Separately Excited and Series DC motors
- Lecture 8 - Speed Control of Separately Excited DC Motor Using Controlled Rectifiers
- Lecture 9 - Analysis of Single Phase Full Controlled Converter-fed Separately Excited DC Motor
- Lecture 10 - Speed Torque Characteristics of Full Controlled Converter-fed Separately Excited DC Motor, Analy
- Lecture 11 - Analysis of Single Phase Half Controlled Converter-fed Separately Excited DC Motor.
- Lecture 12 - Three Phase Full Controlled Converter-fed Separately Excited DC Motor, Multi-quadrant Operation
- Lecture 13 - Dual Converter-fed DC Motor, Multi-quadrant Operation Using Field Current Reversal
- Lecture 14 - DC Chopper-fed Separately Excited DC Motor for Motoring and Braking
- Lecture 15 - Two-quadrant DC Chopper, Four-quadrant DC Chopper
- Lecture 16 - Dynamic Braking of DC Motor by Chopper Controlled Resistor, Closed-loop Operation of DC Drives,
- Lecture 17 - Speed Torque Characteristics of Induction Motor, Operation of Induction Motor from Non-sinusoidal
- Lecture 18 - Operation of Induction Motor from Non-sinusoidal Supply
- Lecture 19 - Stator Current of Induction Motor with Non-sinusoidal Supply, Operation of Induction Motor with
- Lecture 20 - Single Phasing of Induction Motor, Braking of Induction Motor
- Lecture 21 - Dynamic braking of induction motor, AC dynamic braking, DC dynamic braking
- Lecture 22 - Analysis of DC dynamic braking of induction motor
- Lecture 23 - Self-excited dynamic braking of induction motor, Speed control of induction motor using stator v
- Lecture 24 - Variable voltage variable frequency control of induction motor, Open loop V/F control
- Lecture 25 - Slip speed control of induction motor, Constant Volt/Hz control with slip speed regulation
- Lecture 26 - Closed-loop Volt/Hz control of induction motor with slip speed regulation, Multi-quadrant operat
- Lecture 27 - Current Source Inverter (CSI) fed induction motor drive
- Lecture 28 - Closed-loop operation of current source inverter (CSI) fed induction motor drive, Control of sli
- Lecture 29 - Closed-loop operation of slip ring induction motor with static rotor resistance control, Slip po

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

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- Lecture 30 - Static Kramer drive and its closed-loop control, Introduction to synchronous motor
- Lecture 31 - Various types of synchronous motors, Equivalent circuit and phasor diagram of cylindrical synchronous motor
- Lecture 32 - Phasor diagram of salient pole synchronous motor, Expression of power and torque for a salient pole synchronous motor
- Lecture 33 - Open-loop V/f control, Torque-speed characteristics, Self controlled synchronous motor drive employing V/f control
- Lecture 34 - Detailed analysis of commutation of load commutated thyristor inverter, Derivation of overlap angle
- Lecture 35 - Low cost brushless DC motor (BLDCM), Trapezoidal permanent magnet AC motor
- Lecture 36 - Trapezoidal permanent magnet AC motor, Derivation of power and torque, Closed-loop control of trapezoidal permanent magnet AC motor
- Lecture 37 - Construction and operating principle of switched reluctance motor
- Lecture 38 - Current/ voltage control for switched reluctance motor, operating modes of switched reluctance motor
- Lecture 39 - Current collector for mainline trains, Nature of traction load, Duty cycle of traction drives
- Lecture 40 - Duty cycle of traction drives, Distance between two stops, Calculation of total tractive effort

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

NPTEL Video Course - Electrical Engineering - NOC:Fuzzy Sets, Logic and Systems and Applications

Subject Co-ordinator - Prof. Nishchal K Verma

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction
- Lecture 2 - Introduction
- Lecture 3 - Fuzzy Sets and Fuzzy Logic Toolbox in MATLAB - I
- Lecture 4 - Fuzzy Sets and Fuzzy Logic Toolbox in MATLAB - II
- Lecture 5 - Membership Functions - I
- Lecture 6 - Membership Functions - II
- Lecture 7 - Nomenclatures used in Fuzzy Set Theory - I
- Lecture 8 - Nomenclatures used in Fuzzy Set Theory - II
- Lecture 9 - Nomenclatures used in Fuzzy Set Theory - III
- Lecture 10 - Set Theoretic Operations on Fuzzy Sets - I
- Lecture 11 - Set Theoretic Operations on Fuzzy Sets - II
- Lecture 12 - Properties of Fuzzy Sets - I
- Lecture 13 - Properties of Fuzzy Sets - II
- Lecture 14 - Properties of Fuzzy Sets - III
- Lecture 15 - Properties of Fuzzy Sets - IV
- Lecture 16 - Properties of Fuzzy Sets - V
- Lecture 17 - Distance between Fuzzy Sets - I
- Lecture 18 - Distance between Fuzzy Sets - II
- Lecture 19 - Distance between Fuzzy Sets - III
- Lecture 20 - Arithmetic Operations on Fuzzy Numbers - I
- Lecture 21 - Arithmetic Operations on Fuzzy Numbers - II
- Lecture 22 - Arithmetic Operations on Fuzzy Numbers - III
- Lecture 23 - Complement of Fuzzy Sets
- Lecture 24 - T-norm Operators
- Lecture 25 - S-norm Operators
- Lecture 26 - Parameterized T-Norm Operators
- Lecture 27 - Parameterized S-Norm Operators
- Lecture 28 - Fuzzy Relation - I
- Lecture 29 - Fuzzy Relation - II

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

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- Lecture 30 - Operations on Crisp and Fuzzy Relations
- Lecture 31 - Projection of Fuzzy Relation Set
- Lecture 32 - Cylindrical Extension of Fuzzy Set
- Lecture 33 - Properties of Fuzzy Relation - I
- Lecture 34 - Properties of Fuzzy Relation - II
- Lecture 35 - Extension Principle
- Lecture 36 - Composition of Fuzzy Relations
- Lecture 37 - Properties of Composition of Fuzzy Relations
- Lecture 38 - Fuzzy Tolerance and Equivalence Relations - I
- Lecture 39 - Fuzzy Tolerance and Equivalence Relations - II
- Lecture 40 - Fuzzy Tolerance and Equivalence Relations - III
- Lecture 41 - Linguistic Hedges
- Lecture 42 - Linguistic Hedges and Negation/ Complement and Connectives
- Lecture 43 - Concentration and Dilation and Composite Linguistic Term and Some Examples
- Lecture 44 - Dilation and Composite Linguistic Term and Some Examples
- Lecture 45 - Some Examples on Composite Linguistic Terms
- Lecture 46 - Contrast Intensification of Fuzzy Sets
- Lecture 47 - Orthogonality of Fuzzy Sets
- Lecture 48 - Fuzzy Rules and Fuzzy Reasoning - I
- Lecture 49 - Fuzzy Rules and Fuzzy Reasoning - II
- Lecture 50 - Fuzzy Inference System
- Lecture 51 - Mamdani Fuzzy Model - I
- Lecture 52 - Mamdani Fuzzy Model - II
- Lecture 53 - Mamdani Fuzzy Model - III
- Lecture 54 - Example on Mamdani Fuzzy Model for Single Antecedent with Three Rules
- Lecture 55 - Example on Mamdani Fuzzy Model for Two Antecedents with Four Rules
- Lecture 56 - Larsen Fuzzy Model - I
- Lecture 57 - Larsen Fuzzy Model - II
- Lecture 58 - Larsen Fuzzy Model - III
- Lecture 59 - Tsukamoto Fuzzy Model
- Lecture 60 - TSK Fuzzy Model

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

NPTEL Video Course - Electrical Engineering - NOC:Peer to Peer Networks

Subject Co-ordinator - Prof. Yatindra N Singh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Peer to Peer Networks
- Lecture 2 - Peer to Peer Network in Telephony
- Lecture 3 - Building DHT Networks
- Lecture 4 - Logarithmic Partitioning of Node ID Space and Index Entry Authenticity
- Lecture 5 - Implementation of Voice over Internet Telephony in P2P Way
- Lecture 6 - Leaf Nodes, Core Nodes and Type of Messages in DHT Networks
- Lecture 7 - Static and Dynamic Partitioning of Node ID Space
- Lecture 8 - PASTRY Protocol
- Lecture 9 - Understanding the PASTRY Protocol through Example
- Lecture 10 - Kademlia
- Lecture 11 - Tapestry
- Lecture 12 - Understanding the Tapestry Protocol through Example
- Lecture 13 - Multi-dimensional Distributed Hash Table
- Lecture 14 - Multi-Layer DHT
- Lecture 15 - Keeping <Key, Value> Pairs at Correct Root Nodes
- Lecture 16 - Abrupt and Graceful Exit of Root Node
- Lecture 17 - Resilience of <Key, Value> Pairs
- Lecture 18 - A P2P Distributed File System
- Lecture 19 - Storage Space Problem and Incentives to Share Storage
- Lecture 20 - P2P Nodes Communications Challenges in Heterogeneous Network Environments
- Lecture 21 - P2P Overlaid Multicast
- Lecture 22 - P2P Overlaid Multicast
- Lecture 23 - A Design of P2P Email System
- Lecture 24 - P2P Mailing List Services
- Lecture 25 - P2P Mailing List Services
- Lecture 26 - P2P Web
- Lecture 27 - P2P Web Search Engine
- Lecture 28 - P2P Internet
- Lecture 29 - P2P in Blockchain

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

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- Lecture 30 - P2P Anonymous Communication
- Lecture 31 - The Anonymous Communication on the Internet through TOR Network
- Lecture 32 - An Introduction To TOR Browser
- Lecture 33 - Hidden Services on TOR Network
- Lecture 34 - MOOC Wrap-Up

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

NPTEL Video Course - Electrical Engineering - NOC:Applied Linear Algebra for Signal Processing, Data Analytics

Subject Co-ordinator - Prof. Aditya K. Jagannatham

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Vector Properties: Addition, Linear Combination, Inner Product, Orthogonality, Norm
- Lecture 2 - Vectors: Unit Norm Vector, Cauchy-Schwarz inequality, Radar Application
- Lecture 3 - Inner Product Application: Beamforming in Wireless Communication Systems
- Lecture 4 - Matrices, Definition, Addition and Multiplication of Matrices
- Lecture 5 - Matrix: Column Space, Linear Independence, Rank of Matrix, Gaussian Elimination
- Lecture 6 - Matrix: Determinant, Inverse Computation, Adjoint, Cofactor Concepts
- Lecture 7 - Applications of Matrices: Solution of System of Linear equations, MIMO Wireless Technology
- Lecture 8 - Applications of Matrices: Electric Circuits, Traffic flows
- Lecture 9 - Applications of Matrices: Graph Theory, Social Networks, Dominance Directed Graph, Influential Nodes
- Lecture 10 - Null Space of Matrix: Definition, Rank-Nullity Theorem, Application in Electric Circuits
- Lecture 11 - Gram-Schmidt Orthogonalization
- Lecture 12 - Gaussian Random Variable: Definition, Mean, Variance, Multivariate Gaussian, Covariance Matrix
- Lecture 13 - Linear Transformation of Gaussian Random Vectors
- Lecture 14 - Machine Learning Application: Gaussian Classification
- Lecture 15 - Eigenvalue: Definition, Characteristic Equation, Eigenvalue Decomposition
- Lecture 16 - Special Matrices: Rotation and Unitary Matrices, Application: Alamouti Code
- Lecture 17 - Positive Semi-definite (PSD) Matrices: Definition, Properties, Eigenvalue Decomposition
- Lecture 18 - Positive Semidefinite Matrix: Example and Illustration of Eigenvalue Decomposition
- Lecture 19 - Machine Learning Application: Principle Component Analysis (PCA)
- Lecture 20 - Computer Vision Application: Face Recognition, Eigenfaces
- Lecture 21 - Least Squares (LS) Solution, Pseudo-Inverse Concept
- Lecture 22 - Least Squares (LS) via Principle of Orthogonality, Projection Matrix, Properties
- Lecture 23 - Application: Pseudo-Inverse and MIMO Zero Forcing (ZF) Receiver
- Lecture 24 - Wireless Application: Multi-Antenna Channel Estimation
- Lecture 25 - Machine Learning Application: Linear Regression
- Lecture 26 - Computation Mathematics Application: Polynomial Fitting
- Lecture 27 - Least Norm Solution
- Lecture 28 - Wireless Application: Multi-user Beamforming
- Lecture 29 - Singular Value Decomposition (SVD): Definition, Properties, Example

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

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- Lecture 30 - SVD Application in MIMO Wireless Technology: Spatial-Multiplexing and High Data Rates
- Lecture 31 - SVD for MIMO wireless optimization, water-filling algorithm, optimal power allocation
- Lecture 32 - SVD application for Machine Learning: Principal component analysis (PCA)
- Lecture 33 - Multiple signal classification (MUSIC) algorithm: system model
- Lecture 34 - MUSIC algorithm for Direction of Arrival (DoA) estimation
- Lecture 35 - Linear minimum mean square error (LMMSE) principle
- Lecture 36 - LMMSE estimate and error covariance matrix
- Lecture 37 - LMMSE estimation in linear systems
- Lecture 38 - LMMSE application: Wireless channel estimation and example
- Lecture 39 - Time-series prediction via auto-regressive (AR) model
- Lecture 40 - Recommender system: design and rating prediction
- Lecture 41 - Recommender system: Illustration via movie rating prediction example
- Lecture 42 - Fast Fourier transform (FFT) and Inverse fast Fourier transform (IFFT)
- Lecture 43 - IFFT/ FFT application in Orthogonal Frequency Division Multiplexing (OFDM) wireless technology
- Lecture 44 - OFDM system: Circulant matrices and properties
- Lecture 45 - OFDM system model: Transmitter and receiver processing
- Lecture 46 - Single-carrier frequency division for multiple access (SC-FDMA) technology
- Lecture 47 - Linear dynamical systems: definition and solution via matrix exponential
- Lecture 48 - Linear dynamical systems: matrix exponential via SVD
- Lecture 49 - Machine Learning application: Support Vector Machines (SVM)
- Lecture 50 - Support Vector Machines (SVM): Problem formulation via maximum hyperplane separation
- Lecture 51 - Sparse regression: problem formulation and relation to Compressive Sensing (CS)
- Lecture 52 - Sparse regression: solution via the Orthogonal Matching Pursuit (OMP) algorithm
- Lecture 53 - OMP Example for Sparse Regression
- Lecture 54 - Machine Learning Application: Clustering
- Lecture 55 - K-Means Clustering algorithm
- Lecture 56 - Introduction to Stochastic Processes and Markov Chains
- Lecture 57 - Discrete Time Markov Chains and Transition Probability Matrix
- Lecture 58 - Discrete Time Markov Chain Examples
- Lecture 59 - m-STEP Transition Probabilities for Discrete Time Markov Chains
- Lecture 60 - Limiting Behavior of Discrete Time Markov Chains
- Lecture 61 - Least Squares Revisited: Rank Deficient Matrix
- Lecture 62 - Least Squares using SVD
- Lecture 63 - Weighted Least Squares
- Lecture 64 - Weighted Least Squares Example
- Lecture 65 - Woodbury Matrix Identity - Matrix Inversion Lemma
- Lecture 66 - Woodbury Matrix Identity - Proof
- Lecture 67 - Conditional Gaussian Density - Mean
- Lecture 68 - Conditional Gaussian Density - Covariance

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

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Lecture 69 - Scalar Linear Model for Gaussian Estimation

Lecture 70 - MMSE Estimate and Covariance for the Scalar Linear Model

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

NPTEL Video Course - Electrical Engineering - NOC:Economic Operations and Control of Power Systems

Subject Co-ordinator - Prof. Gururaj Mirle Vishwanath, Prof. Narayana Prasad Padhy

Co-ordinating Institute - IIT - Kanpur

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

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

NPTEL Video Course - Electrical Engineering - NOC:Digital Switching

Subject Co-ordinator - Prof. Yatindra N Singh

Co-ordinating Institute - IIT - Kanpur

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

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

NPTEL Video Course - Electrical Engineering - NOC:Analog VLSI Design

Subject Co-ordinator - Prof. Imon Mondal

Co-ordinating Institute - IIT - Kanpur

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

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

NPTEL Video Course - Electrical Engineering - Electrical Machines I

Subject Co-ordinator - Dr. D. Kastha

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Operating Principles and Construction of Single Phase Transformers
- Lecture 3 - Modeling of Single Phase Transformers
- Lecture 4 - Equivalent Circuits of Single Phase Transformers
- Lecture 5 - Testing of Single Phase Transformers
- Lecture 6 - Efficiency of Single Phase Transformers
- Lecture 7 - Voltage Regulation of Single Phase Transformers
- Lecture 8 - Parallel Operation of Single Phase Transformers
- Lecture 9 - Harmonics and Switching Transients in Single Phase Transformers
- Lecture 10 - Introduction to Three Phase Transformer
- Lecture 11 - Construction of Three Phase Transformers
- Lecture 12 - Three Phase Transformer Connections
- Lecture 13 - Three Phase Transformer Phase Groups Part - I
- Lecture 14 - Three Phase Transformer Phase Groups Part - II
- Lecture 15 - Analysis and Testing of Three Phase Transformers
- Lecture 16 - Operation of Three Phase Transformers
- Lecture 17 - Auto Transformers
- Lecture 18 - Three Winding Transformers
- Lecture 19 - Scott Connected Transformers
- Lecture 20 - Potential and Current Transformers
- Lecture 21 - Operating Principles of DC Machines
- Lecture 22 - Constructional Features of DC Machines
- Lecture 23 - Generated EMF and Torque in DC Machines
- Lecture 24 - Armature Reaction
- Lecture 25 - Commutation in DC Machines
- Lecture 26 - Separately Excited DC Generators
- Lecture 27 - DC Shunt Generators
- Lecture 28 - Compound DC Generators
- Lecture 29 - Interconnected DC Generators

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

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- Lecture 30 - Characteristics of DC Shunt Motors
- Lecture 31 - Starting of DC Shunt Motors
- Lecture 32 - Speed Control of DC Shunt Motors
- Lecture 33 - Braking of DC Shunt Motors
- Lecture 34 - Electronic Control of DC Shunt Motors
- Lecture 35 - Testing of DC Shunt Motors
- Lecture 36 - Characteristics of DC Series Motors
- Lecture 37 - Starting and Braking of DC Series Motors
- Lecture 38 - Speed Control and of DC Series Motors
- Lecture 39 - Testing of DC Series Motors
- Lecture 40 - Characteristics of Compound DC Series Motors

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

NPTEL Video Course - Electrical Engineering - Optimal Control

Subject Co-ordinator - Prof. G.D. Ray

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Optimization Problem
- Lecture 2 - Introduction to Optimization Problem
- Lecture 3 - Optimality Conditions for Function of Several Variables
- Lecture 4 - Optimality Conditions for Function of Several Variables (Continued.)
- Lecture 5 - Unconstrained Optimization Problem (Numerical Techniques)
- Lecture 6 - Solution of Unconstrained Optimization Problem Using Conjugate Gradient Method and Networks Method
- Lecture 7 - Solution of Unconstrained Optimization Problem Using Conjugate Gradient Method and Networks Method
- Lecture 8 - Solution of Constraint Optimization Problem-Karush-Kuhn Tucker (KKT) Conditions
- Lecture 9 - Solution of Constraint Optimization Problem-Karush-Kuhn Tucker (KKT) Conditions (Continued.)
- Lecture 10 - Problem and Solution Session
- Lecture 11 - Post Optimality Analysis, Convex Function and its Properties
- Lecture 12 - Post Optimality Analysis, Convex Function and its Properties (Continued.)
- Lecture 13 - Quadratic Optimization Problem Using Linear Programming
- Lecture 14 - Matrix form of the Simplex Method
- Lecture 15 - Matrix form of the Simplex Method (Continued.)
- Lecture 16 - Solution of Linear Programming Using Simplex Method
- Lecture 17 - Solution of Linear Programming Using Simplex Method
- Lecture 18 - Solution of LP Problems with Two Phase Method
- Lecture 19 - Solution of LP Problems with Two Phase Method (Continued.)
- Lecture 20 - Standard Primal and Dual Problems
- Lecture 21 - Relationship Between Primal and Dual Variables
- Lecture 22 - Solution of Quadratic Programming Problem Using Simplex Method
- Lecture 23 - Interior Point Method for Solving Optimization Problems
- Lecture 24 - Interior Point Method for Solving Optimization Problems (Continued.)
- Lecture 25 - Solution of Nonlinear Programming Problem Using Exterior Penalty Function Method
- Lecture 26 - Solution of Nonlinear Programming Problem Using Exterior Penalty Function Method (Continued.)
- Lecture 27 - Solution of Nonlinear Programming Problem Using Interior Penalty Function Method
- Lecture 28 - Solution of Nonlinear Programming Problem Using Interior Penalty Function Method (Continued.)
- Lecture 29 - Multiobjective Optimization Problem

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

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- Lecture 30 - Dynamic Optimization Problem
- Lecture 31 - Dynamic Optimization Problem
- Lecture 32 - Dynamic Optimization Problem
- Lecture 33 - Numerical Example and Solution of Optimal Control Problem using Calculus of Variation principle
- Lecture 34 - Numerical Example and Solution of Optimal Control Problem using Calculus of Variation principle
- Lecture 35 - Hamiltonian Formulation for solution of optimal Control problem and numerical example
- Lecture 36 - Hamiltonian Formulation for solution of optimal Control problem and numerical example (Continued)
- Lecture 37 - Performance Indices and Linear Quadratic Regulator Problem
- Lecture 38 - Performance Indices and Linear Quadratic Regulator Problem (Continued.)
- Lecture 39 - Solution and Stability Analysis of Finite - time LQR Problem
- Lecture 40 - Solution and Infinite - time LQR Problem and Stability Analysis
- Lecture 41 - Numerical Example and Methods for Solution of A.R.E.
- Lecture 42 - Numerical Example and Methods for Solution of A.R.E. (Continued.)
- Lecture 43 - Frequency Domain Interpretation of LQR Controlled System
- Lecture 44 - Gain and Phase Margin of LQR Controlled System
- Lecture 45 - The Linear Quadratic Gaussian Problem
- Lecture 46 - Loop-Transfer Recovery
- Lecture 47 - Dynamic Programming for Discrete Time Systems
- Lecture 48 - Minimum  $\hat{a}$  Time Control of a Linear Time Invariant System
- Lecture 49 - Solution of Minimum  $\hat{a}$  Time Control Problem with an Example
- Lecture 50 - Constraint in Control Inputs and State Variables
- Lecture 51 - Constraint in Control Inputs and State Variables (Continued...)
- Lecture 52 - Norms for Vectors, Matrices, Signals and Linear Systems
- Lecture 53 - Signal and System Norms
- Lecture 54 - Internal Stability, Sensitivity and Complementary Sensitivity Functions
- Lecture 55 - Internal Stability, Sensitivity and Complementary Sensitivity Functions (Continued...)
- Lecture 56 - Plant Uncertainty and Standard form for Robust Stability Analysis
- Lecture 57 - Plant Uncertainty and Standard form for Robust Stability Analysis (Continued...)
- Lecture 58 - Frequency Response of Linear System and Singular Value Decomposition of System
- Lecture 59 - Control Problem Statement in H-  $\alpha$  Framework
- Lecture 60 - Control Problem Statement in H -  $\alpha$  Framework (Continued...)

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

NPTEL Video Course - Electrical Engineering - Chaos, Fractals and Dynamic Systems

Subject Co-ordinator - Prof. S. Banerjee

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Representations of Dynamical Systems
- Lecture 2 - Vector Fields of Nonlinear Systems
- Lecture 3 - Limit Cycles
- Lecture 4 - The Lorenz Equation - I
- Lecture 5 - The Lorenz Equation - II
- Lecture 6 - The Rossler Equation and Forced Pendulum
- Lecture 7 - The Chua's Circuit
- Lecture 8 - Discrete Time Dynamical Systems
- Lecture 9 - The Logistic Map and Period doubling
- Lecture 10 - Flip and Tangent Bifurcations
- Lecture 11 - Intermittency Transcritical and pitchfork
- Lecture 12 - Two Dimensional Maps
- Lecture 13 - Bifurcations in Two Dimensional Maps
- Lecture 14 - Introduction to Fractals
- Lecture 15 - Mandelbrot Sets and Julia Sets
- Lecture 16 - The Space Where Fractals Live
- Lecture 17 - Interactive Function Systems
- Lecture 18 - IFS Algorithms
- Lecture 19 - Fractal Image Compression
- Lecture 20 - Stable and Unstable Manifolds
- Lecture 21 - Boundary Crisis and Interior Crisis
- Lecture 22 - Statistics of Chaotic Attractors
- Lecture 23 - Matrix Times Circle
- Lecture 24 - Lyapunov Exponent
- Lecture 25 - Frequency Spectra of Orbits
- Lecture 26 - Dynamics on a Torus
- Lecture 27 - Dynamics on a Torus
- Lecture 28 - Analysis of Chaotic Time Series
- Lecture 29 - Analysis of Chaotic Time Series

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

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- Lecture 30 - Lyapunou Function and Centre Manifold Theory
- Lecture 31 - Non-Smooth Bifurcations
- Lecture 32 - Non-Smooth Bifurcations
- Lecture 33 - Normal form for Piecewise Smooth 2D Maps
- Lecture 34 - Bifurcations in Piecewise Linear 2D Maps
- Lecture 35 - Bifurcations in Piecewise Linear 2D Maps
- Lecture 36 - Multiple Attractor Bifurcation and Dangerous
- Lecture 37 - Dynamics of Discontinuous Maps
- Lecture 38 - Introduction to Floquet Theory
- Lecture 39 - The Monodromy Matrix and the Saltation Matrix
- Lecture 40 - Control of Chaos

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

NPTEL Video Course - Electrical Engineering - Digital Signal Processing

Subject Co-ordinator - Prof. T.K. Basu

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Discrete Time Signal and System  
Lecture 2 - Discrete Time Signal and System (Continued...)  
Lecture 3 - Discrete Time Signal and System (Continued...)  
Lecture 4 - Frequency Domain Representation of Discrete Signals  
Lecture 5 - Z-Transform  
Lecture 6 - Z-Transform (Continued...)  
Lecture 7 - Solution of Difference Equation  
Lecture 8 - Tutorial on Discrete Time Signals & Their Transforms  
Lecture 9 - Relation Between Discrete Time and Continuous Signals  
Lecture 10 - Discrete Fourier Transform (DFT)  
Lecture 11 - Discrete Fourier Transform (DFT) (Continued...)  
Lecture 12 - Discrete Fourier Transform (DFT) (Continued...)  
Lecture 13 - State Space Representation  
Lecture 14 - Filters Introduction  
Lecture 15 - FIR Filters  
Lecture 16 - FIR Filters (Continued...) Introduction to IIR Filters  
Lecture 17 - IIR Filters (Continued...)  
Lecture 18 - IIR Filters (Continued...)  
Lecture 19 - IIR Filters (Continued...)  
Lecture 20 - Tutorial & Introduction to Computer Aided Design of Filters  
Lecture 21 - Computer Aided Design of Filters  
Lecture 22 - FFT and Computer Aided Design of Filters  
Lecture 23 - Introduction to Lattice Filter  
Lecture 24 - Lattice Filter (Continued...)  
Lecture 25 - Effects of Quantization  
Lecture 26 - Effects of Quantization (Continued...)  
Lecture 27 - Effects of Quantization (Continued...)  
Lecture 28 - Effects of Quantization (Continued...)  
Lecture 29 - Random Signals

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

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- Lecture 30 - Relationship Between Real and Imaginary Parts of DTFT
- Lecture 31 - Relationship Between Real and Imaginary Parts of DTFT
- Lecture 32 - Relationship Between Real and Imaginary Parts of DTFT
- Lecture 33 - Multi rate Signal Processing
- Lecture 34 - Multi rate Signal Processing (Continued...)
- Lecture 35 - Polyphase Decomposition

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

NPTEL Video Course - Electrical Engineering - Dynamics of Physical Systems

Subject Co-ordinator - Prof. S. Banerjee

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to System Elements
- Lecture 2 - Newton's Method and Constraints
- Lecture 3 - Derivation of the Lagrangian Equation
- Lecture 4 - Using the lagrangian Equation to Obtain Differential Equations (Part-I)
- Lecture 5 - Using the lagrangian Equation to Obtain Differential Equations (Part-II)
- Lecture 6 - Using the lagrangian Equation to Obtain Differential Equations (Part-III)
- Lecture 7 - Using the lagrangian Equation to Obtain Differential Equations (Part-IV)
- Lecture 8 - Obtaining First Order Equations
- Lecture 9 - Application of the Hamiltonian Method
- Lecture 10 - Obtaining Differential Equations Using Kirchoff's Laws
- Lecture 11 - The Graph Theory Approach for Electrical Circuits (Part-I)
- Lecture 12 - The Graph Theory Approach for Electrical Circuits (Part-II)
- Lecture 13 - The Bond Graph Approach - I
- Lecture 14 - The Bond Graph Approach - II
- Lecture 15 - The Bond Graph Approach - III
- Lecture 16 - The Bond Graph Approach - IV
- Lecture 17 - The Bond Graph Approach - V
- Lecture 18 - The Bond Graph Approach - VI
- Lecture 19 - The Bond Graph Approach - VII
- Lecture 20 - Numerical Solution of Differential Equations
- Lecture 21 - Dynamics in the State Space
- Lecture 22 - Vector Field Around Equilibrium Points - I
- Lecture 23 - Vector Field Around Equilibrium Points - II
- Lecture 24 - Vector Field Around Equilibrium Points - III
- Lecture 25 - Vector Field Around Equilibrium Points - IV
- Lecture 26 - High Dimensional Linear Systems
- Lecture 27 - Linear Systems with External Input - I
- Lecture 28 - Linear Systems with External Input - II
- Lecture 29 - Linear Systems with External Input - III

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

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- Lecture 30 - Dynamics of Nonlinear Systems - I
- Lecture 31 - Dynamics of Nonlinear Systems - II
- Lecture 32 - Dynamics of Nonlinear Systems - III
- Lecture 33 - Discrete-Time Dynamical Systems - I
- Lecture 34 - Discrete-Time Dynamical Systems - II

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

NPTEL Video Course - Electrical Engineering - Energy Resources and Technology

Subject Co-ordinator - Prof. S. Banerjee

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Thermodynamics  
Lecture 2 - Quality of Energy  
Lecture 3 - Complete Cycle Analysis of Fossil Fuels  
Lecture 4 - Energy in Transportation  
Lecture 5 - Other Fossil Fuels  
Lecture 6 - Energy Economics  
Lecture 7 - Energy Economics  
Lecture 8 - Thermal Power Plants  
Lecture 9 - Thermal Power Plants  
Lecture 10 - Hydroelectric Power  
Lecture 11 - Hydroelectric Power  
Lecture 12 - Nuclear Power Generation  
Lecture 13 - Nuclear Fusion Reactors  
Lecture 14 - Environmental Effects of Conventional Power  
Lecture 15 - Solar Thermal Energy Conversion  
Lecture 16 - Solar Concentrating Collectors  
Lecture 17 - Photovoltaic Power Generation  
Lecture 18 - Photovoltaic Power Generation (Continued.)  
Lecture 19 - Photovoltaic Power Generation (Continued.)  
Lecture 20 - Photovoltaic Power Generation (Continued.)  
Lecture 21 - Wind Energy - I  
Lecture 22 - Wind Energy - II  
Lecture 23 - Wind Energy - III  
Lecture 24 - Wind Energy - IV  
Lecture 25 - Wind Energy - V  
Lecture 26 - Wind Energy - VI  
Lecture 27 - Wind Electrical Conversion - I  
Lecture 28 - Wind Electrical Conversion - II  
Lecture 29 - Wind Electrical Conversion - III

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

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- Lecture 30 - Tidal Energy
- Lecture 31 - Tidal Energy
- Lecture 32 - Tidal Energy
- Lecture 33 - Ocean Thermal Energy Conversion
- Lecture 34 - Solar Pond and Wave Power
- Lecture 35 - Geothermal Energy
- Lecture 36 - Solar Distillation and Biomass Energy
- Lecture 37 - Energy Storage
- Lecture 38 - Magneto hydrodynamic Power Generation
- Lecture 39 - Magneto hydrodynamic Power Generation
- Lecture 40 - Hydrogen Economy

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

NPTEL Video Course - Electrical Engineering - Estimation of Signals and Systems

Subject Co-ordinator - Prof. S. Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Probability Theory
- Lecture 3 - Random Variables
- Lecture 4 - Function of Random Variable Joint Density
- Lecture 5 - Mean and Variance
- Lecture 6 - Random Vectors Random Processes
- Lecture 7 - Random Processes and Linear Systems
- Lecture 8 - Some Numerical Problems
- Lecture 9 - Miscellaneous Topics on Random Process
- Lecture 10 - Linear Signal Models
- Lecture 11 - Linear Mean Sq.Error Estimation
- Lecture 12 - Auto Correlation and Power Spectrum Estimation
- Lecture 13 - Z-Transform Revisited Eigen Vectors/Values
- Lecture 14 - The Concept of Innovation
- Lecture 15 - Least Squares Estimation Optimal IIR Filters
- Lecture 16 - Introduction to Adaptive Filters
- Lecture 17 - State Estimation
- Lecture 18 - Kalman Filter-Model and Derivation
- Lecture 19 - Kalman Filter-Derivation (Continued...)
- Lecture 20 - Estimator Properties
- Lecture 21 - The Time-Invariant Kalman Filter
- Lecture 22 - Kalman Filter-Case Study
- Lecture 23 - System identification Introductory Concepts
- Lecture 24 - Linear Regression-Recursive Least Squares
- Lecture 25 - Variants of LSE
- Lecture 26 - Least Square Estimation
- Lecture 27 - Model Order Selection Residual Tests
- Lecture 28 - Practical Issues in Identification
- Lecture 29 - Estimation Problems in Instrumentation and Control

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

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Lecture 30 - Conclusion

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

NPTEL Video Course - Electrical Engineering - Illumination Engineering

Subject Co-ordinator - Prof. N.K. Kishore

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Illumination Engineering
- Lecture 2 - Instructional Objectives
- Lecture 3 - Eye and Vision - I
- Lecture 4 - Eye and Vision - II
- Lecture 5 - Laws of Illumination
- Lecture 6 - Photometry
- Lecture 7 - Incandescent Lamps
- Lecture 8 - Discharge Lamps - I
- Lecture 9 - Discharge Lamps - II
- Lecture 10 - Discharge Lamps - III
- Lecture 11 - Illumination Systems - I
- Lecture 12 - Illumination Systems - II
- Lecture 13 - Glare
- Lecture 14 - Color
- Lecture 15 - Interior Lighting
- Lecture 16 - Sports Lighting
- Lecture 17 - Road Lighting
- Lecture 18 - Lighting Calculations
- Lecture 19 - Lighting Applications
- Lecture 20 - Conclusions on Illumination Engineering

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

NPTEL Video Course - Electrical Engineering - Industrial Automation and Control

Subject Co-ordinator - Prof. S. Sen, Prof. S. Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Architecture of Industrial Automation Systems
- Lecture 3 - Measurement Systems Characteristics
- Lecture 4 - Temperature Measurement
- Lecture 5 - Pressure, Force and Torque Sensors
- Lecture 6 - Motion Sensing
- Lecture 7 - Flow Measurement
- Lecture 8 - Signal Conditioning
- Lecture 9 - Signal Conditioning (Continued.)
- Lecture 10 - Data Acquisition Systems
- Lecture 11 - Introduction to Automatic Control
- Lecture 12 - P-I-D Control
- Lecture 13 - PID Control Tuning
- Lecture 14 - Feedforward Control Ratio Control
- Lecture 15 - Time Delay Systems and Inverse Response Systems
- Lecture 16 - Special Control Structures
- Lecture 17 - Concluding Lesson on Process Control
- Lecture 18 - Introduction to Sequence Control, PLC, RLL
- Lecture 19 - Sequence Control. Scan Cycle, Simple RLL Programs
- Lecture 20 - Sequence Control. More RLL Elements, RLL Syntax
- Lecture 21 - A Structured Design Approach to Sequence
- Lecture 22 - PLC Hardware Environment
- Lecture 23 - Introduction To CNC Machines
- Lecture 24 - Contour generation and Motion Control
- Lecture 25 - Flow Control Valves
- Lecture 26 - Hydraulic Control Systems - I
- Lecture 27 - Hydraulic Control Systems - II
- Lecture 28 - Industrial Hydraulic Circuit
- Lecture 29 - Pneumatic Control Systems - I

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

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- Lecture 30 - Pneumatic Systems - II
- Lecture 31 - Energy Savings with Variable Speed Drives
- Lecture 32 - DC Motor Drives
- Lecture 33 - DC and BLDC Servo Drives
- Lecture 34 - Induction Motor Drives
- Lecture 35 - Step Motor Drives BLDC Drives
- Lecture 36 - Embedded Systems
- Lecture 37 - The Fieldbus Network - I
- Lecture 38 - The Fieldbus Network - II
- Lecture 39 - Higher Level Automation Systems
- Lecture 40 - Course Review and Conclusion



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

NPTEL Video Course - Electrical Engineering - Industrial Instrumentation

Subject Co-ordinator - Prof. Alok Barua

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Industrial Instrumentation
- Lecture 2 - Dynamic Characteristics
- Lecture 3 - Dynamic Characteristics (Continued.)
- Lecture 4 - Strain gauge
- Lecture 5 - Load cell
- Lecture 6 - Torque Measurement
- Lecture 7 - Thermistor
- Lecture 8 - Thermocouples
- Lecture 9 - Resistance Temperature Detector
- Lecture 10 - LVDT
- Lecture 11 - Capacitance Transducers
- Lecture 12 - Flowmeter - I
- Lecture 13 - Flowmeter - II
- Lecture 14 - Flowmeter - III
- Lecture 15 - Flowmeter - IV
- Lecture 16 - Flowmeter - V
- Lecture 17 - Problems on Temperature Sensors
- Lecture 18 - Pressure Sensors
- Lecture 19 - Low Pressure Measurement
- Lecture 20 - pH and Viscosity Measurement
- Lecture 21 - Problem and Solutions On Industrial Instrumentation
- Lecture 22 - Signal Conditioning Circuits - I
- Lecture 23 - Signal Conditioning Circuits - II
- Lecture 24 - Piezoelectric Sensors
- Lecture 25 - Ultrasonic Sensors
- Lecture 26 - Nucleonic Instrumentation
- Lecture 27 - Measurement Of Magnetic Field
- Lecture 28 - Optoelectronic Sensor - I
- Lecture 29 - Optoelectronic Sensor - II

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

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- Lecture 30 - Synchro
- Lecture 31 - Dissolved Oxygen Sensors - I
- Lecture 32 - Dissolved Oxygen Sensors - II
- Lecture 33 - Flapper - Nozzle
- Lecture 34 - Smart Sensors
- Lecture 35 - Chromatography - I
- Lecture 36 - Chromatography - II
- Lecture 37 - Pollution Measurement
- Lecture 38 - Control Valve - I
- Lecture 39 - Control Valve - II
- Lecture 40 - Signal Conditioning Integrated Circuits

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

NPTEL Video Course - Electrical Engineering - Networks Signals and Systems

Subject Co-ordinator - Prof. T.K. Basu

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Network Elements and Sources
- Lecture 2 - Introduction to Linearity and Nonlinearity
- Lecture 3 - Distributed & Lumped Parameters 2-port Networks
- Lecture 4 - Two-port Parameters Short Circuit, Open Circuit
- Lecture 5 - Tutorial
- Lecture 6 - Locus Diagram - Introduction to Signals
- Lecture 7 - Signals (Continued.) Laplace Transforms
- Lecture 8 - Laplace Transform (Continued.)
- Lecture 9 - Tutorial on Laplace Transform
- Lecture 10 - Frequency Response Bode Plot
- Lecture 11 - Bode Plot (Continued.)
- Lecture 12 - Bode Plot (Continued.) - Poles & Zeros
- Lecture 13 - Driving Point Immittance Functions - Realisability Conditions
- Lecture 14 - Two - Element Synthesis
- Lecture 15 - Two - Element Synthesis (Continued.)
- Lecture 16 - Tutorial
- Lecture 17 - Tutorial
- Lecture 18 - Graph Theory
- Lecture 19 - Graph Theory (Continued.)
- Lecture 20 - Graph Theory (Continued.)
- Lecture 21 - Graph Theory (Continued.)
- Lecture 22 - Image Impedance, Iterative Impedance
- Lecture 23 - Image Impedance, Iterative Impedance
- Lecture 24 - Characteristic Impedance and Design of Filters
- Lecture 25 - Analysis of Resistive Networks Computer Aided
- Lecture 26 - R-L-C Two-Terminal Network
- Lecture 27 - Parts of Network Functions
- Lecture 28 - Parts of Network Functions (Continued.)
- Lecture 29 - Tutorial

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

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- Lecture 30 - Tutorial (Continued.)
- Lecture 31 - Tutorial
- Lecture 32 - Synthesis of 2-port Network
- Lecture 33 - Synthesis of 2-port Network (Continued.)
- Lecture 34 - Synthesis of 2-port Network (Continued.)
- Lecture 35 - Fourier Series
- Lecture 36 - Fourier Series (Continued.)

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

NPTEL Video Course - Electrical Engineering - Power System Analysis

Subject Co-ordinator - Prof. A.K. Sinha

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Power system analysis
- Lecture 2 - Introduction to Single Line Diagram
- Lecture 3 - Transmission Line Parameters
- Lecture 4 - Inductance Calculation (Three Phase)
- Lecture 5 - Transmission Line Capacitance
- Lecture 6 - Transmission Line Capacitance (Continued..)
- Lecture 7 - Transmission Line Modeling
- Lecture 8 - Transmission Line Modeling Long Line
- Lecture 9 - Transmission Line Steady State Operation
- Lecture 10 - Transmission Line Steady State Control Voltage
- Lecture 11 - Transmission System A Review
- Lecture 12 - Transformer Model
- Lecture 13 - Synchronous Machine Model
- Lecture 14 - Synchronous Machine Model
- Lecture 15 - Load Model
- Lecture 16 - Power Flow - I
- Lecture 17 - Power Flow - II
- Lecture 18 - Power Flow - III
- Lecture 19 - Power Flow - IV
- Lecture 20 - Power Flow - V
- Lecture 21 - Power Flow - VI
- Lecture 22 - Power Flow - VII
- Lecture 23 - Review of Power System Component Models
- Lecture 24 - Review of Power Flow Study
- Lecture 25 - Short Circuit Analysis
- Lecture 26 - Symmetrical Component Analysis
- Lecture 27 - Sequence Networks
- Lecture 28 - Unbalanced Fault Analysis
- Lecture 29 - Unbalanced Fault Analysis

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- Lecture 30 - Fault Analysis for Large power Systems
- Lecture 31 - Bus Impedance Matrix
- Lecture 32 - Asymmetrical Fault Analysis Using Z - Bus
- Lecture 33 - Power System Stability - I
- Lecture 34 - Power System Stability - II
- Lecture 35 - Power System Stability - III
- Lecture 36 - Power System Stability - IV
- Lecture 37 - Power System Stability - V
- Lecture 38 - Power System Stability - VI
- Lecture 39 - Power System Stability - VII
- Lecture 40 - Power System Stability - VIII

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

NPTEL Video Course - Electrical Engineering - NOC:Industrial Automation and Control

Subject Co-ordinator - Prof. S. Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Introduction (Continued...)
- Lecture 3 - Architecture of Industrial Automation Systems
- Lecture 4 - Architecture of Industrial Automation Systems (Continued...)
- Lecture 5 - Measurement Systems Characteristics
- Lecture 6 - Measurement Systems Characteristics (Continued...)
- Lecture 7 - Data Acquisition Systems
- Lecture 8 - Data Acquisition Systems (Continued...)
- Lecture 9 - Introduction to Automatic Control
- Lecture 10 - Introduction to Automatic Control (Continued...)
- Lecture 11 - P-I-D Control
- Lecture 12 - P-I-D Control (Continued...)
- Lecture 13 - PID Controller Tuning
- Lecture 14 - PID Controller Tuning (Continued...)
- Lecture 15 - Feedforward Control Ratio Control
- Lecture 16 - Feedforward Control Ratio Control (Continued...)
- Lecture 17 - Time Delay Systems and Inverse Response Systems
- Lecture 18 - Time Delay Systems and Inverse Response Systems (Continued...)
- Lecture 19 - Special Control Structures
- Lecture 20 - Special Control Structures (Continued...)
- Lecture 21 - Concluding Lesson on Process Control (Self-study)
- Lecture 22 - Introduction to Sequence Control, PLC, RLL
- Lecture 23 - Introduction to Sequence Control, PLC, RLL (Continued...)
- Lecture 24 - Sequence Control, Scan Cycle, Simple RLL Programs
- Lecture 25 - Sequence Control, Scan Cycle, Simple RLL Programs (Continued...)
- Lecture 26 - Sequence Control, More RLL Elements, RLL Syntax
- Lecture 27 - Sequence Control, More RLL Elements, RLL Syntax (Continued...)
- Lecture 28 - A Structured Design Approach to Sequence Control
- Lecture 29 - A Structured Design Approach to Sequence Control (Continued...)

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- Lecture 30 - PLC Hardware Environment
- Lecture 31 - PLC Hardware Environment (Continued...)
- Lecture 32 - Flow Control Valves
- Lecture 33 - Flow Control Valves (Continued...)
- Lecture 34 - Hydraulic Control Systems - I
- Lecture 35 - Hydraulic Control Systems - I (Continued...)
- Lecture 36 - Hydraulic Control Systems - II
- Lecture 37 - Hydraulic Control Systems - II (Continued...)
- Lecture 38 - Industrial Hydraulic Circuit
- Lecture 39 - Industrial Hydraulic Circuit (Continued...)
- Lecture 40 - Pneumatic Control Systems - I
- Lecture 41 - Pneumatic Control Systems - I (Continued...)
- Lecture 42 - Pneumatic Systems - II
- Lecture 43 - Pneumatic Systems - II (Continued...)
- Lecture 44 - Energy Savings with Variable Speed Drives
- Lecture 45 - Energy Savings with Variable Speed Drives (Continued...)
- Lecture 46 - Introduction To CNC Machines
- Lecture 47 - Introduction To CNC Machines
- Lecture 48 - The Fieldbus Network - I
- Lecture 49 - The Fieldbus Network - I (Continued...)
- Lecture 50 - Higher Level Automation Systems
- Lecture 51 - Higher Level Automation Systems (Continued...)
- Lecture 52 - Course Review and Conclusion (Self Study)



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

NPTEL Video Course - Electrical Engineering - NOC:Medical Image Analysis

Subject Co-ordinator - Prof. Debdoot Sheet

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Medical Image Analysis
- Lecture 2 - X Ray and CT Imaging
- Lecture 3 - Magnetic Resonance Imaging
- Lecture 4 - Ultrasound Imaging
- Lecture 5 - Optical Microscopy and Molecular Imaging
- Lecture 6 - Texture in Medical Images
- Lecture 7 - Region Growing and Clustering
- Lecture 8 - Random Walks for Segmentation
- Lecture 9 - Active Contours for Segmentation
- Lecture 10 - Systematic Evaluation and Validation
- Lecture 11 - Decision Trees for Segmentation and Classification
- Lecture 12 - Random Forests for Segmentation and Classification
- Lecture 13 - Neural Networks for Segmentation and Classification
- Lecture 14 - Deep Learning for Medical Image Analysis
- Lecture 15 - Deep Learning for Medical Image Analysis (Continued...)
- Lecture 16 - Retinal Vessel Segmentation
- Lecture 17 - Vessel Segmentation in Computed Tomography Scan of Lungs
- Lecture 18
- Lecture 19 - Tissue Characterization in Ultrasound
- Lecture 20

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

NPTEL Video Course - Electrical Engineering - NOC:Biomedical Signal Processing

Subject Co-ordinator - Prof. Sudipta Mukhopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Motivation
- Lecture 2 - Preliminaries
- Lecture 3 - Biomedical Signal Origin and Dynamics
- Lecture 4 - Biomedical Signal Origin and Dynamics (Continued...)
- Lecture 5 - Biomedical Signal Origin and Dynamics (Continued...)
- Lecture 6 - Biomedical Signal Origin and Dynamics (Continued...)
- Lecture 7 - Artifact Removal
- Lecture 8 - Artifact Removal (Continued...)
- Lecture 9 - Artifact Removal (Continued...)
- Lecture 10 - Artifact Removal (Continued...)
- Lecture 11 - Artifact Removal (Continued...)
- Lecture 12 - Artifact Removal (Continued...)
- Lecture 13 - Artifact Removal (Continued...)
- Lecture 14 - Artifact Removal (Continued...)
- Lecture 15 - Artifact Removal (Continued...)
- Lecture 16 - Artifact Removal (Continued...)
- Lecture 17 - Artifact Removal (Continued...)
- Lecture 18 - Event Detection
- Lecture 19 - Event Detection (Continued...)
- Lecture 20 - Event Detection (Continued...)
- Lecture 21 - Event Detection (Continued...)
- Lecture 22 - Event Detection (Continued...)
- Lecture 23 - Event Detection (Continued...)
- Lecture 24 - Event Detection (Continued...)
- Lecture 25 - Homomorphic Processing
- Lecture 26 - Homomorphic Processing (Continued...)
- Lecture 27 - Waveform Analysis
- Lecture 28 - Waveform Analysis (Continued...)
- Lecture 29 - Waveform Analysis

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

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- Lecture 30 - Waveform Analysis (Continued...)
- Lecture 31 - Waveform Analysis (Continued...)
- Lecture 32 - Waveform Analysis (Continued...)
- Lecture 33 - Waveform Analysis (Continued...)
- Lecture 34 - Frequency Domain Characterisation
- Lecture 35 - Frequency Domain Characterisation (Continued...)
- Lecture 36 - Frequency Domain Characterisation (Continued...)
- Lecture 37 - Frequency Domain Characterisation (Continued...)
- Lecture 38 - Frequency Domain Characterisation (Continued...)
- Lecture 39 - Frequency Domain Characterisation (Continued...)
- Lecture 40 - Modelling of Biomedical Systems
- Lecture 41 - Modelling of Biomedical Systems (Continued...)
- Lecture 42 - Modelling of Biomedical Systems (Continued...)
- Lecture 43 - Modelling of Biomedical Systems (Continued...)
- Lecture 44 - Modelling of Biomedical Systems (Continued...)
- Lecture 45 - Modelling of Biomedical Systems (Continued...)
- Lecture 46 - Modelling of Biomedical Systems (Continued...)
- Lecture 47 - Tutorial - I
- Lecture 48 - Tutorial - I (Continued...)
- Lecture 49 - Tutorial - I (Continued...)
- Lecture 50 - Tutorial - II
- Lecture 51 - Tutorial - II (Continued...)
- Lecture 52 - Tutorial - II (Continued...)
- Lecture 53 - Tutorial - III
- Lecture 54 - Tutorial - III (Continued...)
- Lecture 55 - Tutorial - III (Continued...)
- Lecture 56 - Tutorial - III (Continued...)
- Lecture 57 - Tutorial - IV
- Lecture 58 - Tutorial - IV (Continued...)
- Lecture 59 - Tutorial - IV (Continued...)
- Lecture 60 - Tutorial - IV (Continued...)
- Lecture 61 - Tutorial - IV (Continued...)
- Lecture 62 - Tutorial - IV (Continued...)
- Lecture 63 - Tutorial - V
- Lecture 64 - Tutorial - V (Continued...)
- Lecture 65 - Tutorial - V (Continued...)
- Lecture 66 - Tutorial - V (Continued...)
- Lecture 67 - Tutorial - V (Continued...)
- Lecture 68 - Live Session

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

NPTEL Video Course - Electrical Engineering - NOC:Microprocessors and Microcontrollers

Subject Co-ordinator - Prof. Santanu Chattopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction  
Lecture 2 - Introduction (Continued...)  
Lecture 3 - Introduction (Continued...)  
Lecture 4 - Basic Computer Organization  
Lecture 5 - Basic computer organization  
Lecture 6 - Basic Computer Organization  
Lecture 7 - 8085 Microprocessors  
Lecture 8 - 8085 Microprocessors (Continued...)  
Lecture 9 - 8085 Microprocessors (Continued...)  
Lecture 10 - 8085 Microprocessors (Continued...)  
Lecture 11 - 8085 Microprocessors (Continued...)  
Lecture 12 - 8085 Microprocessors (Continued...)  
Lecture 13 - 8085 Microprocessors (Continued...)  
Lecture 14 - 8085 Microprocessors (Continued...)  
Lecture 15 - 8085 Microprocessors (Continued...)  
Lecture 16 - 8085 Microprocessors (Continued...)  
Lecture 17 - 8085 Microprocessors (Continued...)  
Lecture 18 - 8085 Microprocessors (Continued...)  
Lecture 19 - 8085 Microprocessors (Continued...)  
Lecture 20 - 8085 Microprocessors (Continued...)  
Lecture 21 - 8085 Microprocessors (Continued...)  
Lecture 22 - 8085 Microprocessors (Continued...)  
Lecture 23 - 8051 Microcontroller  
Lecture 24 - 8051 Microcontroller (Continued...)  
Lecture 25 - 8051Microcontroller (Continued...)  
Lecture 26 - 8051 Microcontroller (Continued...)  
Lecture 27 - 8051 Microcontroller (Continued...)  
Lecture 28 - 8051 Microcontroller (Continued...)  
Lecture 29 - 8051 Microcontroller (Continued...)

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

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Lecture 30 - 8051 Microcontroller (Continued...)  
Lecture 31 - 8051 Microcontroller (Continued...)  
Lecture 32 - 8051 Microcontroller (Continued...)  
Lecture 33 - 8051 Microcontroller (Continued...)  
Lecture 34 - 8051 Microcontroller (Continued...)  
Lecture 35 - 8051 Microcontroller (Continued...)  
Lecture 36 - 8051 Programming Examples  
Lecture 37 - 8051 Programming Examples (Continued...)  
Lecture 38 - 8051 Programming Examples (Continued...)  
Lecture 39 - 8051 Programming Examples (Continued...)  
Lecture 40 - 8051 Programming Examples (Continued...)  
Lecture 41 - ARM  
Lecture 42 - ARM (Continued...)  
Lecture 43 - ARM (Continued...)  
Lecture 44 - ARM (Continued...)  
Lecture 45 - ARM (Continued...)  
Lecture 46 - ARM (Continued...)  
Lecture 47 - ARM (Continued...)  
Lecture 48 - ARM (Continued...)  
Lecture 49 - PIC  
Lecture 50 - PIC, AVR  
Lecture 51 - AVR (Continued...)  
Lecture 52 - AVR (Continued...)  
Lecture 53 - Interfacing  
Lecture 54 - Interfacing (Continued...)  
Lecture 55 - Interfacing (Continued...)  
Lecture 56 - Interfacing (Continued...)  
Lecture 57 - Interfacing (Continued...)  
Lecture 58 - Interfacing (Continued...)  
Lecture 59 - 8086  
Lecture 60 - 8086 (Continued...)  
Lecture 61 - 8086 (Continued...)  
Lecture 62 - 8086 (Continued...)  
Lecture 63 - 8086 (Continued...)  
Lecture 64 - 8087

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

NPTEL Video Course - Electrical Engineering - NOC:Deep Learning For Visual Computing

Subject Co-ordinator - Prof. Debdoot Sheet

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Visual Computing
- Lecture 2 - Feature Extraction for Visual Computing
- Lecture 3 - Feature Extraction with Python
- Lecture 4 - Neural Networks for Visual Computing
- Lecture 5 - Classification with Perceptron Model
- Lecture 6 - Introduction to Deep Learning with Neural Networks
- Lecture 7 - Introduction to Deep Learning with Neural Networks
- Lecture 8 - Multilayer Perceptron and Deep Neural Networks
- Lecture 9 - Multilayer Perceptron and Deep Neural Networks
- Lecture 10 - Classification with Multilayer Perceptron
- Lecture 11 - Autoencoder for Representation Learning and MLP Initialization
- Lecture 12 - MNIST handwritten digits classification using autoencoders
- Lecture 13 - Fashion MNIST classification using autoencoders
- Lecture 14 - ALL-IDB Classification using autoencoders
- Lecture 15 - Retinal Vessel Detection using autoencoders
- Lecture 16 - Stacked Autoencoders
- Lecture 17 - MNIST and Fashion MNIST with Stacked Autoencoders
- Lecture 18 - Denoising and Sparse Autoencoders
- Lecture 19 - Sparse Autoencoders for MNIST classification
- Lecture 20 - Denoising Autoencoders for MNIST classification
- Lecture 21 - Cost Function
- Lecture 22 - Classification cost functions
- Lecture 23 - Optimization Techniques and Learning Rules
- Lecture 24 - Gradient Descent Learning Rule
- Lecture 25 - SGD and ADAM Learning Rules
- Lecture 26 - Convolutional Neural Network Building Blocks
- Lecture 27 - Simple CNN Model
- Lecture 28 - LeNet Definition
- Lecture 29 - Training a LeNet for MNIST Classification

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

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- Lecture 30 - Modifying a LeNet for CIFAR
- Lecture 31 - Convolutional Autoencoder and Deep CNN
- Lecture 32 - Convolutional Autoencoder for Representation Learning
- Lecture 33 - AlexNet
- Lecture 34 - VGGNet
- Lecture 35 - Revisiting AlexNet and VGGNet for Computational Complexity
- Lecture 36 - GoogLeNet - Going very deep with convolutions
- Lecture 37 - GoogLeNet
- Lecture 38 - ResNet - Residual Connections within Very Deep Networks and DenseNet - Densely connected networks
- Lecture 39 - ResNet
- Lecture 40 - DenseNet
- Lecture 41 - Space and Computational Complexity in DNN
- Lecture 42 - Assessing the space and computational complexity of very deep CNNs
- Lecture 43 - Domain Adaptation and Transfer Learning in Deep Neural Networks
- Lecture 44 - Transfer Learning a GoogLeNet
- Lecture 45 - Transfer Learning a ResNet
- Lecture 46 - Activation pooling for object localization
- Lecture 47 - Region Proposal Networks (rCNN and Faster rCNN)
- Lecture 48 - GAP + rCNN
- Lecture 49 - Semantic Segmentation with CNN
- Lecture 50 - UNet and SegNet for Semantic Segmentation
- Lecture 51 - Autoencoders and Latent Spaces
- Lecture 52 - Principle of Generative Modeling
- Lecture 53 - Adversarial Autoencoders
- Lecture 54 - Adversarial Autoencoder for Synthetic Sample Generation
- Lecture 55 - Adversarial Autoencoder for Classification
- Lecture 56 - Understanding Video Analysis
- Lecture 57 - Recurrent Neural Networks and Long Short-Term Memory
- Lecture 58 - Spatio-Temporal Deep Learning for Video Analysis
- Lecture 59 - Activity recognition using 3D-CNN
- Lecture 60 - Activity recognition using CNN-LSTM

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

NPTEL Video Course - Electrical Engineering - NOC:Power System Engineering

Subject Co-ordinator - Prof. Debapriya Das

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1

Lecture 2

Lecture 3

Lecture 4

Lecture 5

Lecture 6

Lecture 7

Lecture 8

Lecture 9

Lecture 10

Lecture 11 - Cables (Continued...)

Lecture 12 - Transient over voltages and Insulation coordination

Lecture 13 - Transient over voltages and Insulation coordination (Continued...)

Lecture 14 - Transient over voltages and Insulation coordination (Continued...)

Lecture 15 - Transient over voltages and Insulation coordination (Continued...)

Lecture 16 - Transient over voltages and Insulation coordination (Continued...)

Lecture 17 - Transient over voltages and Insulation coordination (Continued...)

Lecture 18 - Transient over voltages and Insulation coordination (Continued...)

Lecture 19 - Transient over voltages and Insulation coordination (Continued...)

Lecture 20 - Corona

Lecture 21 - Corona (Continued...)

Lecture 22 - Corona (Continued...)

Lecture 23 - Corona (Continued...), Sag and Tension Analysis

Lecture 24 - Sag and Tension Analysis (Continued...)

Lecture 25 - Sag and Tension Analysis (Continued...)

Lecture 26 - Sag and Tension Analysis (Continued...)

Lecture 27 - Sag and Tension Analysis (Continued...)

Lecture 28 - Sag and Tension Analysis (Continued...)

Lecture 29 - Load flow of radial distribution networks

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- Lecture 30 - Load flow of radial distribution networks (Continued...)
- Lecture 31 - Load flow of radial distribution networks (Continued...)
- Lecture 32 - Load flow of radial distribution networks (Continued...)
- Lecture 33 - Load flow of radial distribution networks (Continued...)
- Lecture 34 - Load flow of radial distribution networks (Continued...)
- Lecture 35 - Load flow of radial distribution networks (Continued...)
- Lecture 36 - Load flow of radial distribution networks (Continued...)
- Lecture 37 - Load flow of radial distribution networks (Continued...), Voltage stability of distribution network
- Lecture 38 - Voltage stability of distribution network, Approximate method
- Lecture 39 - Application of capacitors in distribution system
- Lecture 40 - Application of capacitors in distribution system (Continued...)
- Lecture 41 - Application of capacitors in distribution system (Continued...)
- Lecture 42 - Application of capacitors in distribution system (Continued...)
- Lecture 43 - Application of capacitors in distribution system (Continued...)
- Lecture 44 - Application of capacitors in distribution system (Continued...), Load frequency control
- Lecture 45 - Load frequency control (Continued...)
- Lecture 46 - Load frequency control (Continued...)
- Lecture 47 - Load frequency control (Continued...)
- Lecture 48 - Load frequency control (Continued...)
- Lecture 49 - Load frequency control (Continued...)
- Lecture 50 - Load frequency control (Continued...)
- Lecture 51 - Load frequency control (Continued...)
- Lecture 52 - Load frequency control (Continued...)
- Lecture 53 - Load frequency control (Continued...)
- Lecture 54 - Load frequency control (Continued...)
- Lecture 55 - Load frequency control (Continued...)
- Lecture 56 - Load frequency control (Continued...)
- Lecture 57 - Automatic generation control
- Lecture 58 - Automatic generation control (Continued...)
- Lecture 59 - Automatic generation control (Continued...), Unit commitment
- Lecture 60 - Unit commitment (Continued...)
- Lecture 61 - Live Session

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

NPTEL Video Course - Electrical Engineering - NOC:Fundamentals of Electrical Engineering

Subject Co-ordinator - Prof. Debapriya Das

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Basic Concepts, Examples  
Lecture 2 - Basic Concepts, Examples (Continued...)  
Lecture 3 - Basic Concepts, Examples (Continued...)  
Lecture 4 - Basic Concepts, Examples (Continued...)  
Lecture 5 - Basic Laws  
Lecture 6 - Basic Laws (Continued...)  
Lecture 7 - Basic Laws (Continued...)  
Lecture 8 - Basic Laws (Continued...)  
Lecture 9 - Basic Laws (Continued...)  
Lecture 10 - Basic Laws (Continued...)  
Lecture 11 - Methods of Circuit Analysis  
Lecture 12 - Methods of Circuit Analysis (Continued...)  
Lecture 13 - Methods of Circuit Analysis (Continued...)  
Lecture 14 - Methods of Circuit Analysis (Continued...)  
Lecture 15 - Methods of Circuit Analysis (Continued...)  
Lecture 16 - Methods of Circuit Analysis (Continued...)  
Lecture 17 - Mesh analysis with current sources, Examples  
Lecture 18 - Methods of Circuit Analysis (Continued...) and Circuit Theorems  
Lecture 19 - Circuit Theorems (Continued...)  
Lecture 20 - Circuit Theorems (Continued...)  
Lecture 21 - Circuit Theorems (Continued...)  
Lecture 22 - Circuit Theorems (Continued...)  
Lecture 23 - Circuit Theorems (Continued...)  
Lecture 24 - Circuit Theorems (Continued...)  
Lecture 25 - Circuit Theorems (Continued...) and Capacitors and Inductors  
Lecture 26 - Capacitors and Inductors (Continued...)  
Lecture 27 - Capacitors and Inductors (Continued...)  
Lecture 28 - Capacitors and Inductors (Continued...)  
Lecture 29 - First Order Circuits

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

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- Lecture 30 - First Order Circuits (Continued...)
- Lecture 31 - First Order Circuits (Continued...)
- Lecture 32 - First Order Circuits (Continued...)
- Lecture 33 - First Order Circuits (Continued...)
- Lecture 34 - First Order Circuits (Continued...)
- Lecture 35 - First Order Circuits (Continued...)
- Lecture 36 - First Order Circuits (Continued...)
- Lecture 37 - Single phase AC circuits
- Lecture 38 - Single phase AC circuits (Continued...)
- Lecture 39 - Single phase AC circuits (Continued...)
- Lecture 40 - Single phase AC circuits (Continued...)
- Lecture 41 - Single phase AC circuits (Continued...)
- Lecture 42 - Single phase AC circuits (Continued...)
- Lecture 43 - Single phase AC circuits (Continued...)
- Lecture 44 - Resonance and Maximum Power Transfer Theorem
- Lecture 45 - Resonance and Maximum Power Transfer Theorem (Continued...)
- Lecture 46 - Resonance and Maximum Power Transfer Theorem (Continued...)
- Lecture 47 - Three phase circuits
- Lecture 48 - Three phase circuits (Continued...)
- Lecture 49 - Three phase circuits (Continued...)
- Lecture 50 - Three phase circuits (Continued...)
- Lecture 51 - Magnetic Circuits
- Lecture 52 - Magnetic Circuits (Continued...)
- Lecture 53 - Magnetic Circuits (Continued...)
- Lecture 54 - Single Phase Transformer
- Lecture 55 - Single Phase Transformer (Continued...)
- Lecture 56 - Single Phase Transformer (Continued...)
- Lecture 57 - Single Phase Transformer (Continued...)
- Lecture 58 - Three phase Induction Motors
- Lecture 59 - Three phase Induction Motors (Continued...)
- Lecture 60 - Three phase Induction Motors (Continued...)
- Lecture 61 - Three phase Induction Motors (Continued...)
- Lecture 62 - DC Motors
- Lecture 63 - DC Motors (Continued...)
- Lecture 64 - DC Motors (Continued...)

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

NPTEL Video Course - Electrical Engineering - NOC:Digital Circuits

Subject Co-ordinator - Prof. Santanu Chattopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction  
Lecture 2 - Introduction (Continued...)  
Lecture 3 - Number System  
Lecture 4 - Number System (Continued...)  
Lecture 5 - Number System (Continued...)  
Lecture 6 - Number System (Continued...)  
Lecture 7 - Number System (Continued...)  
Lecture 8 - Boolean Algebra  
Lecture 9 - Boolean Algebra (Continued...)  
Lecture 10 - Boolean Algebra (Continued...)  
Lecture 11 - Boolean Algebra (Continued...)  
Lecture 12 - Boolean Algebra (Continued...)  
Lecture 13 - Boolean Algebra (Continued...)  
Lecture 14 - Logic Gates  
Lecture 15 - Logic Gates (Continued...)  
Lecture 16 - Logic Gates (Continued...)  
Lecture 17 - Logic Gates (Continued...)  
Lecture 18 - Logic Gates (Continued...)  
Lecture 19 - Logic Gates (Continued...)  
Lecture 20 - Arithmetic Circuits  
Lecture 21 - Arithmetic Circuits (Continued...)  
Lecture 22 - Arithmetic Circuits (Continued...)  
Lecture 23 - Decoders, Multiplexers, PLA  
Lecture 24 - Decoders, Multiplexers, PLA (Continued...)  
Lecture 25 - Decoders, Multiplexers, PLA (Continued...)  
Lecture 26 - Decoders, Multiplexers, PLA (Continued...)  
Lecture 27 - Decoders, Multiplexers, PLA (Continued...)  
Lecture 28 - Sequential Circuits  
Lecture 29 - Sequential Circuits (Continued...)

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

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- Lecture 30 - Sequential Circuits (Continued...)
- Lecture 31 - Sequential Circuits (Continued...)
- Lecture 32 - Sequential Circuits (Continued...)
- Lecture 33 - Sequential Circuits (Continued...)
- Lecture 34 - Sequential Circuits (Continued...)
- Lecture 35 - Finite State Machine
- Lecture 36 - Finite State Machine (Continued...)
- Lecture 37 - Data Converters
- Lecture 38 - Data Converters (Continued...)
- Lecture 39 - Data Converters (Continued...)
- Lecture 40 - Data Converters (Continued...)
- Lecture 41 - Memory
- Lecture 42 - Memory (Continued...)
- Lecture 43 - Memory (Continued...)
- Lecture 44 - FPGA
- Lecture 45 - FPGA (Continued...)
- Lecture 46 - VHDL
- Lecture 47 - VHDL(Continued...)
- Lecture 48 - 8085 Microprocessor
- Lecture 49 - 8085 Microprocessor (Continued...)
- Lecture 50 - 8085 Microprocessor (Continued...)
- Lecture 51 - 8085 Microprocessor (Continued...)
- Lecture 52 - 8085 Microprocessor (Continued...)
- Lecture 53 - 8085 Microprocessor (Continued...)
- Lecture 54 - 8085 Microprocessor (Continued...)
- Lecture 55 - 8085 Microprocessor (Continued...)
- Lecture 56 - 8085 Microprocessor (Continued...)
- Lecture 57 - 8085 Microprocessor (Continued...)
- Lecture 58 - 8085 Microprocessor (Continued...)
- Lecture 59 - 8085 Microprocessor (Continued...)
- Lecture 60 - 8085 Microprocessor (Continued...)
- Lecture 61 - 8085 Microprocessor (Continued...)
- Lecture 62 - 8085 Microprocessor (Continued...)
- Lecture 63 - 8086 Microprocessor
- Lecture 64 - 8086 Microprocessor (Continued...)
- Lecture 65 - 8086 Microprocessor (Continued...)

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

NPTEL Video Course - Electrical Engineering - NOC:Analysis and Design Principles of Microwave Antennas

Subject Co-ordinator - Dr. Amitabha Bhattacharya

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Concept of Scalar and Vector Potentials
- Lecture 2 - Radiation From a Current Element (Hertzian Dipole)
- Lecture 3 - Specific Properties of the Radiated Fields from a Current Element
- Lecture 4 - General Properties of Radiated Fields from an Antenna
- Lecture 5 - Farfield and Radiation Pattern of an Antenna
- Lecture 6 - Directivity and Gain of an Antenna
- Lecture 7 - Idea of Efficiency, Beamwidth, Polarisation and Bandwidth
- Lecture 8 - Polarization of Antenna
- Lecture 9 - Impedance of Antenna
- Lecture 10 - Effective Aperture of an Antenna
- Lecture 11 - Friss Transmission Equation and Antenna Temperature
- Lecture 12 - Dipole And Monopole Antena
- Lecture 13 - Dipole And Monopole Antena (Continued...)
- Lecture 14 - BALUN
- Lecture 15 - Loop Antenna
- Lecture 16 - Folded Dipole Antenna
- Lecture 17 - Introduction to Antenna Array
- Lecture 18 - Antenna Array Theory
- Lecture 19 - Broadside Uniform Linear Array
- Lecture 20 - Endfire Linear Uniform Array
- Lecture 21 - Parasitic Array and Log Periodic Antenna
- Lecture 22 - Analysis Procedures of Aperture Antennas
- Lecture 23 - Analysis Procedures of Aperture Antenna (Continued...)
- Lecture 24 - Horn Antenna
- Lecture 25 - Horn Antenna (Continued...)
- Lecture 26 - Reflector Antennas
- Lecture 27 - Paraboloid Reflector Antenna (Continued...)
- Lecture 28 - Paraboloid Reflector Antenna (Continued...)
- Lecture 29 - Dual Reflector Antenna

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

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- Lecture 30 - Generalised Analysis of Antenna
- Lecture 31 - Solution of Wave Equation for Electric and Magnetic Current Densities
- Lecture 32 - Farfield Evaluation of Spherical Wave Radiation by Generalised Antenna
- Lecture 33 - Slot Antenna
- Lecture 34 - Open Ended Waveguide Antenna and Microstrip Antenna
- Lecture 35 - Numerical Evaluation of Wire Antenna Currents
- Lecture 36 - Solution of Intregal Equation by Moment Method
- Lecture 37 - Array Pattern Synthesis
- Lecture 38 - Array Pattern Synthesis (Continued...)
- Lecture 39 - Ultra Wideband Antennas
- Lecture 40 - Antenna Measurements

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

NPTEL Video Course - Electrical Engineering - NOC:Architectural Design of Digital Integrated Circuits

Subject Co-ordinator - Prof. Indranil Hatai

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction to VLSI Design Flow  
Lecture 2 - Introduction to VLSI Design Flow  
Lecture 3 - Introduction to VLSI Design Flow  
Lecture 4 - Algorithm to Efficient Architecture Mapping  
Lecture 5 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 6 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 7 - Tutorial on Algorithm to Efficient Architecture Mapping  
Lecture 8 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 9 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 10 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 11 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 12 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 13 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 14 - Algorithm to Efficient Architecture Mapping (Continued...)  
Lecture 15 - Efficient Adder Architecture  
Lecture 16 - Efficient Adder Architecture (Continued...)  
Lecture 17 - Efficient Adder Architecture (Continued...)  
Lecture 18 - Efficient Adder Architecture  
Lecture 19 - Efficient Adder Architecture  
Lecture 20 - Efficient Adder Architecture  
Lecture 21 - Efficient Adder Architecture  
Lecture 22 - Efficient Adder Architecture  
Lecture 23 - Efficient Adder Architecture  
Lecture 24 - Efficient Adder Architecture  
Lecture 25 - Pipelining and Parallel Processing  
Lecture 26 - Pipelining and Parallel Processing  
Lecture 27 - Multiplier Architecture  
Lecture 28 - Multiplier Architecture  
Lecture 29 - Multiplier Architecture

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

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- Lecture 30 - Multiplier Architecture
- Lecture 31 - Multiplier Architecture
- Lecture 32 - Multiplier Architecture
- Lecture 33 - Multiplier Architecture
- Lecture 34 - Multiplier Architecture
- Lecture 35 - Squaring Circuit Design
- Lecture 36 - Reconfigurable Constant Multiplier Design
- Lecture 37 - Reconfigurable Constant Multiplier Design
- Lecture 38 - Reconfigurable Constant Multiplier Design
- Lecture 39 - Fixed Point Number Representation
- Lecture 40 - Fixed Point Number Representation
- Lecture 41 - CORDIC Architecture
- Lecture 42 - CORDIC Architecture
- Lecture 43 - CORDIC Architecture
- Lecture 44 - CORDIC Architecture
- Lecture 45 - Timing Analysis
- Lecture 46 - Timing Analysis
- Lecture 47 - Timing Analysis
- Lecture 48 - Logic Hazard
- Lecture 49 - FFT Architecture
- Lecture 50 - FFT Architecture (Continued...)
- Lecture 51 - Timing analysis Basics
- Lecture 52 - Timing analysis Basics (Continued...)
- Lecture 53 - Timing analysis Basics (Continued...)
- Lecture 54 - Timing Issuesin Digital IC Design
- Lecture 55 - Timing Issuesin Digital IC Design (Continued...)
- Lecture 56 - Timing Issuesin Digital IC Design (Continued...)
- Lecture 57 - Timing Issuesin Digital IC Design (Continued...)
- Lecture 58 - Architectural Design of Digital Integrated Circuits
- Lecture 59 - Design Tips for Basic Circuits Design (Continued...)
- Lecture 60 - Design Tips for Basic Circuits Design (Continued...)
- Lecture 61 - Design Tips for Basic Circuits Design (Continued...)
- Lecture 62 - Low Power Digital Design
- Lecture 63 - Low Power Digital Design (Continued...)
- Lecture 64 - Low Power Digital Design
- Lecture 65 - Low Power Digital Design (Continued...)
- Lecture 66 - Hardware for Machine Learning
- Lecture 67 - Hardware for Machine Learning

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

NPTEL Video Course - Electrical Engineering - NOC:Electrical Machines-II

Subject Co-ordinator - Prof.Tapas Kumar Bhattacharya

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Inductance, Self and Mutual
- Lecture 2 - Relationship of Inductances in Transformer
- Lecture 3 - Equivalent Circuit from Circuit KVL Equations
- Lecture 4 - Co-efficient of Coupling , Energy Stored in Coupled Coils
- Lecture 5 - A Single Conductor Generator and Motor
- Lecture 6 - Analysis of Single Conductor Generator and Motor
- Lecture 7 - Analysis of Single Conductor Generator and Motor (Continued...)
- Lecture 8 - Flux Density Distribution in Space and Nature emf
- Lecture 9 - Flux Density Distribution in Space and Nature emf (Continued...)
- Lecture 10 - From Linear to Rotating Machine
- Lecture 11 - From Linear to Rotating Machine (Continued...)
- Lecture 12 - Basic Underlying Principle of Operation of Rotating Machine
- Lecture 13 - Basic Underlying Principle of Operation of Rotating Machine (Continued...)
- Lecture 14 - Flux Density Distribution along the Air Gap
- Lecture 15 - Flux Density Distribution along the Air Gap (Continued...)
- Lecture 16 - Induced Voltage in a Coil in a Rotating Machine
- Lecture 17 - Induced Voltage in a Coil in a Rotating Machine (Continued...)
- Lecture 18 - Induced Voltage in a Coil in a Rotating Machine (Continued...)
- Lecture 19 - Induced Voltage due to Fundamental and Harmonic Components of Flux Density Distribution
- Lecture 20 - Distributed Coils Connected in Series Resultant Voltage
- Lecture 21 - Distribution Factor
- Lecture 22 - Pitch Factor and Winding Factor
- Lecture 23 - How to decide about Short Pitch Angle  $\tilde{\alpha} \cdot \hat{\mu}$
- Lecture 24 - Double Layer 3-phase Winding - An Introduction
- Lecture 25 - Winding Table for 3-phase Distributed Winding
- Lecture 26 - Winding Table for 3-phase Distributed Winding with Examples
- Lecture 27 - Winding Table for 3-phase Distributed Winding with Examples (Continued...)
- Lecture 28 - 120 degree Phase Spread Winding with Examples
- Lecture 29 - Winding Table of 120 degree Phase Spread Coils and Group Connection

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

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- Lecture 30 - Introduction to Rotating Magnetic Field
- Lecture 31 - Rotating Magnetic Field (Continued...), Mechanical and Electrical Speed
- Lecture 32 - Speed and Direction of Rotating Field
- Lecture 33 - Synchronous Speed and How to Calculate Induced Voltage in a Coil
- Lecture 34 - Introduction to Induction Motor
- Lecture 35 - Introduction to Induction Motor (Continued...)
- Lecture 36 - General Expression of Torque in Terms of Stator and Rotor Fields
- Lecture 37 - Torque Angle and Torque Expression
- Lecture 38 - How to Fix Up Positions of Net Field, Rotor Field and Stator Field
- Lecture 39 - Slip
- Lecture 40 - Equivalent Circuit of 3-Phase Induction Motor
- Lecture 41 - Equivalent Circuit of 3-Phase Induction Motor (Continued...)
- Lecture 42 - Equivalent Circuit of 3-Phase Induction Motor (Continued...)
- Lecture 43 - Expression for Electromagnetic Torque in terms of Equivalent Circuit Parameters
- Lecture 44 - Maximum Electromagnetic Torque and Slip at Which it Occurs
- Lecture 45 - Typical Torque Slip Characteristic and Operating Point
- Lecture 46 - Change in Torque-slip Characteristic as Supply Voltage and Rotor Resistance are Varied
- Lecture 47 - Types of Induction Motor - Slip Ring Type
- Lecture 48 - Introduction to Cage Induction Motor
- Lecture 49 - Cage Motor Can Operate for Different Stator Poles
- Lecture 50 - Core Loss in Induction Motor and Simplified Equivalent Circuit
- Lecture 51 - Torque Expression from Simplified Equivalent Circuit and Introduction to Circle Diagram
- Lecture 52 - Circle Diagram (Continued...)
- Lecture 53 - Exact Power Flow Diagram and Circle Diagram
- Lecture 54 - Circle Diagram (Continued...)
- Lecture 55 - Circle Diagram
- Lecture 56 - Circle Diagram from Test Data
- Lecture 57 - Starting of 3 Phase Induction Motor - Introduction
- Lecture 58 - DOL and Reactor Starting
- Lecture 59 - DOL and Auto Transformer Starting
- Lecture 60 - Introduction to Speed Control
- Lecture 61 - Idea of VVVF Speed Control of Induction Motor
- Lecture 62 - Speed Control Using Two Motors
- Lecture 63 - Electrical Braking of 3 Phase Induction Motor
- Lecture 64 - Braking (Continued...)
- Lecture 65 - Introduction to Single Phase Induction Motor - Sequence Currents
- Lecture 66 - Development of Equivalent Circuit
- Lecture 67 - Development of Equivalent Circuit (Continued...)
- Lecture 68 - Torque-slip Ch. of 1 ph. I-M Running on Single Winding

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

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- Lecture 69 - Introduction to Starting of 1ph. Induction Motor
- Lecture 70 - Expression for Starting Torque and Need for Phase Splitting
- Lecture 71 - Resistor Split 1 ph. Induction Motor
- Lecture 72 - Capacitor Split 1 ph Induction Motor
- Lecture 73 - Starting of 1 ph. Induction Motor (Continued...)
- Lecture 74 - Synchronous Machine Construction
- Lecture 75 - Synchronous Generator - Introduction
- Lecture 76 - Synchronisation
- Lecture 77 - Expression for Induced Voltage and O.C. Phasor Diagram
- Lecture 78 - Loaded Synchronous Generator - Resultant Field
- Lecture 79 - Armature Reaction and Synchronous Reactance. Basic Phasor Diagram
- Lecture 80 - General Mode of Operation - Retro Field, Stator Field and Resultant Field
- Lecture 81 - Complete Phasor Diagram and Expression for Complex Power
- Lecture 82 - Synchronous Motor Operation, Phasor Diagram and Power Expression
- Lecture 83 - Effect of Variation of Field Current in Generator
- Lecture 84 - Effect of Variation Field Current in Synchronous Motor, Introduction to Salient Pole Machine
- Lecture 85 - Analysis of Salient Pole Synchronous Machine
- Lecture 86 - Phasor Diagram of Salient Pole Synchronous Machine for Generator and Motor Mode
- Lecture 87 - Expression for Load Angle and Expression for Power
- Lecture 88 - Phasor Diagrams of Salient Pole Synchronous Generator under Various Conditions
- Lecture 89 - Phasor Diagrams of Salient Pole Synchronous Motor under Various Conditions
- Lecture 90 - O.C and S.C Test on Synchronous Generator

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

NPTEL Video Course - Electrical Engineering - NOC:Digital Electronic Circuits

Subject Co-ordinator - Prof. Goutam Saha

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Transistor as a switch
- Lecture 3 - Performance Issues and Introduction to TTL
- Lecture 4 - Transistor Transistor Logic (TTL)
- Lecture 5 - CMOS Logic
- Lecture 6 - Basic Gates and their representations
- Lecture 7 - Fundamentals of Boolean Algebra
- Lecture 8 - Boolean Function to Truth Table and Implementaion Issues
- Lecture 9 - Truth Table to Boolean Function and Implementaion Issues
- Lecture 10 - Karnugh Map and Digital Circuit Realization
- Lecture 11 - Karnaugh Map to Entered Variable Map
- Lecture 12 - Quine - McClusky (QM) Algorithm
- Lecture 13 - Cost Criteria and Minimization of Multiple Output Functions
- Lecture 14 - Static 1 Hazard
- Lecture 15 - Static 0 Hazard and Dynamic Hazard
- Lecture 16 - Multiplexer
- Lecture 17 - Multiplexer
- Lecture 18 - Demultiplexer / Decoder
- Lecture 19 - Decoder with BCD Input and Encoder
- Lecture 20 - Parity Generator and Checker
- Lecture 21 - Number System
- Lecture 22 - Negative Number and 2s Complement Arithmetic
- Lecture 23 - Arithmetic Building Blocks - I
- Lecture 24 - Arithmetic Building Blocks - II
- Lecture 25 - Overflow Detection and BCD Arithmetic
- Lecture 26 - Magnitude Comparator
- Lecture 27 - Arithmetic Logic Unit (ALU)
- Lecture 28 - Unweighted Code
- Lecture 29 - Error Detection and Correction Code

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

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- Lecture 30 - Multiplication and Division
- Lecture 31 - SR Latch and Introduction to Clocked Flip-Flop
- Lecture 32 - Edge-Triggered Flip-Flop
- Lecture 33 - Representations of Flip-Flops
- Lecture 34 - Analysis of Sequential Logic Circuit
- Lecture 35 - Conversion of Flip-Flops and Flip-Flop Timing Parameters
- Lecture 36 - Register and Shift Register
- Lecture 37 - Shift Register
- Lecture 38 - Application of Shift Register
- Lecture 39 - Linear Feedback Shift Register
- Lecture 40 - Serial Addition, Multiplication and Division
- Lecture 41 - Asynchronous Counter
- Lecture 42 - Decoding Logic and Synchronous Counter
- Lecture 43 - Cascading
- Lecture 44 - Counter Design with Asynchronous Reset and Preset
- Lecture 45 - Counter Design as Synthesis Problem and Few Other Uses of Counter
- Lecture 46 - Synthesis of Sequential Logic Circuit
- Lecture 47 - Moore Model and Mealy Model
- Lecture 48 - Algorithmic State Machine (ASM) Chart and Synthesis of Sequential Logic Circuit
- Lecture 49 - Circuit Realization from ASM Chart and State Minimization
- Lecture 50 - State Minimization by Implication Table and Partitioning Method
- Lecture 51 - Digital to Analog Conversion - I
- Lecture 52 - Digital to Analog Conversion - II
- Lecture 53 - Analog to Digital Conversion - I
- Lecture 54 - Analog to Digital Conversion - II
- Lecture 55 - Certain Performance Issue of ADC and DAC
- Lecture 56 - Introduction to Memory
- Lecture 57 - Static Random Access Memory (SRAM)
- Lecture 58 - Dynamic RAM (DRAM) and Memory Expansion
- Lecture 59 - Read Only Memory (ROM)
- Lecture 60 - PAL, PLA, CPLD, FPGA

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

NPTEL Video Course - Electrical Engineering - NOC:Power System Dynamics, Control and Monitoring

Subject Co-ordinator - Prof. Debapriya Das

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Power System stability
- Lecture 2 - Power System stability (Continued...)
- Lecture 3 - Power System stability (Continued...)
- Lecture 4 - Power System stability (Continued...)
- Lecture 5 - Power System stability (Continued...)
- Lecture 6 - Power System Stability (Continued...)
- Lecture 7 - Power System Stability (Continued...)
- Lecture 8 - Power System Stability (Continued...)
- Lecture 9 - Power System Stability (Continued...)
- Lecture 10 - Power System Stability (Continued...)
- Lecture 11 - Power System Stability (Continued...)
- Lecture 12 - Power System Stability (Continued...)
- Lecture 13 - Power System Stability (Continued...)
- Lecture 14 - Power System Stability (Continued...)
- Lecture 15 - Power System Stability (Continued...)
- Lecture 16 - Power System Stability (Continued...)
- Lecture 17 - Power System Stability (Continued...)
- Lecture 18 - Power System Stability (Continued...)
- Lecture 19 - Power System Stability (Continued...)
- Lecture 20 - Power System Stability (Continued...)
- Lecture 21 - Power System stability (Continued...)
- Lecture 22 - Power System stability, Eigen properties of the state matrix
- Lecture 23 - Power System stability, Eigen properties of the state matrix (Continued...)
- Lecture 24 - Power System stability, Eigen properties of the state matrix (Continued...)
- Lecture 25 - Power System stability, Eigen properties of the state matrix (Continued...)
- Lecture 26 - Power System stability, Eigen properties of the state matrix (Continued...)
- Lecture 27 - Power System stability, Eigen properties of the state matrix, Transient stability
- Lecture 28 - Transient stability
- Lecture 29 - Transient stability (Continued...)

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

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- Lecture 30 - Transient stability (Continued...)
- Lecture 31 - Transient stability
- Lecture 32 - Transient stability, Automatic generation control conventional scenario
- Lecture 33 - Automatic generation control conventional scenario
- Lecture 34 - Automatic generation control conventional scenario
- Lecture 35 - Automatic generation control conventional scenario
- Lecture 36 - Automatic generation control conventional scenario
- Lecture 37 - Automatic generation control conventional scenario
- Lecture 38 - Automatic generation control conventional scenario
- Lecture 39 - Automatic generation control conventional scenario
- Lecture 40 - Automatic generation control conventional scenario
- Lecture 41 - AGC in deregulated system
- Lecture 42 - AGC in deregulated system (Continued...)
- Lecture 43 - AGC in deregulated system (Continued...)
- Lecture 44 - AGC in deregulated system (Continued...)
- Lecture 45 - AGC in deregulated system (Continued...)
- Lecture 46 - AGC in deregulated system (Continued...)
- Lecture 47 - AGC in deregulated system (Continued...)
- Lecture 48 - AGC in deregulated system (Continued...)
- Lecture 49 - AGC in deregulated system, Reactive power and voltage control
- Lecture 50 - Reactive power and voltage control
- Lecture 51 - Reactive power and voltage control, State estimation in power system
- Lecture 52 - State estimation in power system
- Lecture 53 - State estimation in power system (Continued...)
- Lecture 54 - State estimation in power system (Continued...)
- Lecture 55 - State estimation in power system (Continued...)
- Lecture 56 - State estimation in power system (Continued...)
- Lecture 57 - Hydraulic turbine modelling
- Lecture 58 - Hydraulic turbine modelling (Continued...)
- Lecture 59 - Subsynchronous oscillation
- Lecture 60 - Subsynchronous oscillation, Windup and non windup limits



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

NPTEL Video Course - Electrical Engineering - NOC:Evolution of Air Interface towards 5G

Subject Co-ordinator - Prof. Suvra Sekhar Das

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Evolution of wireless Communication
- Lecture 2 - Evolution of wireless Communication Standards From 2G to 5G
- Lecture 3 - Evolution of wireless Communication Standards From 2G to 5G (Continued...)
- Lecture 4 - Evolution of wireless Communication Standards From 2G to 5G (Continued...)
- Lecture 5 - Evolution of wireless Communication Standards From 2G to 5G (Continued...)
- Lecture 6 - Requirements and operating scenarios of 5G
- Lecture 7 - Requirements and operating scenarios of 5G (Continued....)
- Lecture 8 - 5G scenarios
- Lecture 9 - Ultra reliable low latency communication
- Lecture 10 - Designing 5G new radio
- Lecture 11 - Fundamental Framework for waveform analysis
- Lecture 12 - Fundamental Framework for waveform analysis (Continued...)
- Lecture 13 - Waveform Design Aspects of 2G
- Lecture 14 - Waveforms in 3G
- Lecture 15 - Waveforms in 3G (Continued...)
- Lecture 16 - Waveform in 4G and 5G (OFDM)
- Lecture 17 - Waveform in 4G and 5G (OFDM) (Continued...)
- Lecture 18 - Waveform in 4G and 5G (OFDM) (Continued...)
- Lecture 19 - Waveform in 4G and 5G (OFDMA)
- Lecture 20 - Waveform in 4G and 5G (OFDMA, SCFDMA, SCFDE)
- Lecture 21 - Waveform in 4G and 5G (SCFDMA Continued...)
- Lecture 22 - Waveform in 5G
- Lecture 23 - Waveform in 5G Numerology
- Lecture 24 - Frame Structure in 5G NR
- Lecture 25 - Numerology in 5G and adaptive subcarrier bandwidth
- Lecture 26 - Numerology in 5G (Continued...)
- Lecture 27 - Waveforms beyond 5G
- Lecture 28 - Waveforms beyond 5G (Continued...)
- Lecture 29 - Waveforms beyond 5G (Continued...)

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

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- Lecture 30 - Waveforms beyond 5G (Continued...)
- Lecture 31 - Waveform beyond 5G (Precoded GFDM)
- Lecture 32 - Comparison of waveforms
- Lecture 33 - Channel models for performance evaluation - Part I
- Lecture 34 - Channel models for performance evaluation - Part II
- Lecture 35 - Channel models for performance evaluation - Part III
- Lecture 36 - MIMO Signal Processing (Receive Diversity)
- Lecture 37 - MIMO Signal Processing
- Lecture 38 - MIMO Signal Processing (Capacity)
- Lecture 39 - MIMO Signal Processing (Capacity and Massive MIMO)
- Lecture 40 - Hybrid beamforming (mmWave)

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

NPTEL Video Course - Electrical Engineering - NOC:Electrical Measurement and Electronic Instruments

Subject Co-ordinator - Prof. Avishek Chatterjee

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - PMMC Instruments
- Lecture 2 - Electrodynamc Instrument
- Lecture 3 - Demonstration of PMMC and Electrodynamc Instruments
- Lecture 4 - Features of PMMC and Electrodynamc Instruments
- Lecture 5 - Moving Iron Instruments
- Lecture 6 - Demonstration of Moving Iron Instrument
- Lecture 7 - Electrostatic Instrument
- Lecture 8 - Derivation of Deflecting Torque in Electrodynamc, Electrostatic and Moving Iron Instrument
- Lecture 9 - Damping and Eddy Current Damping
- Lecture 10 - Dynamics of the Moving Coil and Damping
- Lecture 11 - Dynamics of the Moving Coil and Damping (Continued...)
- Lecture 12 - Ballistic Galvanometer
- Lecture 13 - Ammeter - I
- Lecture 14 - Ammeter - II
- Lecture 15 - Voltmeter
- Lecture 16 - Ohmmeters - I
- Lecture 17 - Ohmmeters - II
- Lecture 18 - Rectifier based Voltmeters and Ammeter - I
- Lecture 19 - Rectifier based Voltmeters and Ammeter - II
- Lecture 20 - Resistance measurement with a Voltmeter and an Ammeter
- Lecture 21 - Four-Terminal Resistance
- Lecture 22 - Problems
- Lecture 23 - Error Calculation
- Lecture 24 - Sensitivity, Accuracy, and Resolution of Wheatstone Bridge
- Lecture 25 - Kelvin Double Bridge
- Lecture 26 - High Resistance Measurement
- Lecture 27 - Wattmeter Connection and Compensated Wattmeter
- Lecture 28 - Single Phase Energy Meter
- Lecture 29 - Demonstration

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

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- Lecture 30 - Single Phase Energy Meter (Continued...)
- Lecture 31 - Connection of Energy Meter, Wattmeter, and Three Phase Supply
- Lecture 32 - DC Potentiometer
- Lecture 33 - AC Potentiometer
- Lecture 34 - Polar potentiometer and phase shifter
- Lecture 35 - Polar potentiometer
- Lecture 36 - Co-ordinate potentiometer
- Lecture 37 - Kelvin-Varley potential divider
- Lecture 38 - Impedance measurement
- Lecture 39 - AC bridges - I
- Lecture 40 - AC bridges - II
- Lecture 41 - AC bridges - III
- Lecture 42 - Current transformer and potential transformer
- Lecture 43 - Review of transformer and magnetic circuit
- Lecture 44 - Errors in Instrument transformer
- Lecture 45 - Flux density measurement with Ballistic Galvanometer
- Lecture 46 - Flux density measurement with Ballistic Galvanometer (Continued...)
- Lecture 47 - Background
- Lecture 48 - Background
- Lecture 49 - Background
- Lecture 50 - Background
- Lecture 51 - Background
- Lecture 52 - Background
- Lecture 53 - Inverting amplifier versus Schmitt Trigger
- Lecture 54 - Non-inverting amplifier versus Schmitt Trigger
- Lecture 55 - Difference amplifier - I
- Lecture 56 - Difference amplifier - II
- Lecture 57 - Difference amplifier - III
- Lecture 58 - Digital frequency meter
- Lecture 59 - Digital frequency meter and Schmitt Trigger
- Lecture 60 - Schmitt Trigger
- Lecture 61 - Schmitt Trigger
- Lecture 62 - Digital frequency meter
- Lecture 63 - Linear ramp type digital voltmeter
- Lecture 64 - Dual slope digital voltmeter - I
- Lecture 65 - Dual slope digital voltmeter - II
- Lecture 66 - Dual slope digital voltmeter and Integrator circuit
- Lecture 67 - Digital ramp type voltmeter
- Lecture 68 - Digital ramp type voltmeter and Successive approximation type voltmeter

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

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- Lecture 69 - ADC and DAC - I
- Lecture 70 - ADC and DAC - II
- Lecture 71 - Why we need electronic Instruments
- Lecture 72 - Instruments with op-amp based amplifiers - I
- Lecture 73 - Instruments with op-amp based amplifiers - II
- Lecture 74 - Instruments with op-amp based amplifiers - III
- Lecture 75 - Instrumentation Amplifier
- Lecture 76 - Function generator
- Lecture 77 - 555-Timer circuit
- Lecture 78 - Astable and monostable oscillator circuits
- Lecture 79 - Pulse generator
- Lecture 80 - Oscilloscope - I
- Lecture 81 - Oscilloscope - II
- Lecture 82 - Emitter follower voltmeter
- Lecture 83 - Linear ohmmeter
- Lecture 84 - Ramp generator

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

NPTEL Video Course - Electrical Engineering - NOC:Principles and Techniques of Modern Radar Systems

Subject Co-ordinator - Dr. Amitabha Bhattacharya

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Historical Development and Application
- Lecture 2 - Radar Bands and System Modeling
- Lecture 3 - Radar Equation
- Lecture 4 - Some Basic Concepts of Pulsed Radar
- Lecture 5 - Some Basic Concepts of Pulsed Radar (Continued...)
- Lecture 6 - Some Basic Concepts of Pulsed Radar (Continued...)
- Lecture 7 - Some Basic Concepts of Pulsed Radar (Continued...)
- Lecture 8 - Tutorial Problems on Basic Concepts of Radar - Part I
- Lecture 9 - Tutorial Problems on Basic Concepts of Radar - Part II
- Lecture 10 - CW Radar
- Lecture 11 - CW Radar Mathematical Model and Applications
- Lecture 12 - FM-CW Radar
- Lecture 13 - Double Frequency CW Radar
- Lecture 14 - Pulsed Radar
- Lecture 15 - MTI Filter
- Lecture 16 - Clutter and Single DLC
- Lecture 17 - Double DLC and Recursive MTI Filter
- Lecture 18 - Multiple prf MTI Radar
- Lecture 19 - Multiple prf MTI Radar and Clutter Attenuation
- Lecture 20 - MTI Improvement Factor
- Lecture 21 - Tutorial Problems on CW and Pulsed Radar - Part I
- Lecture 22 - Tutorial Problems on CW and Pulsed Radar - Part II
- Lecture 23 - Pulsed Doppler Radar
- Lecture 24 - Pulsed Doppler Radar (Continued...) and Search Radar
- Lecture 25 - Tracking Radar
- Lecture 26 - Tracking Radar (Continued...)
- Lecture 27 - Tracking Radar (Continued...)
- Lecture 28 - Tracking Radar (Continued...)
- Lecture 29 - Tracking Radar (Continued...)

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

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- Lecture 30 - Tracking Radar (Continued...)
- Lecture 31 - Tracking Radar (Continued...)
- Lecture 32 - Tutorial Problems on Search and Tracking Radar
- Lecture 33 - Detection in Radar Receiver
- Lecture 34 - Detection in Radar Receiver (Continued...)
- Lecture 35 - Detection in Radar Receiver (Continued...)
- Lecture 36 - Detection in Radar Receiver (Continued...)
- Lecture 37 - Detection in Radar Receiver (Continued...)
- Lecture 38 - Detection in Radar Receiver (Continued...)
- Lecture 39 - Detection in Radar Receiver (Continued...)
- Lecture 40 - Detection in Radar Receiver (Continued...)
- Lecture 41 - Detection in Radar Receiver (Continued...)
- Lecture 42 - Detection in Radar Receiver (Continued...)
- Lecture 43 - Detection in Radar Receiver (Continued...)
- Lecture 44 - Detection in Radar Receiver (Continued...)
- Lecture 45 - Detection in Radar Receiver (Continued...)
- Lecture 46 - Detection in Radar Receiver (Continued...)
- Lecture 47 - Tutorial Problems on Detection in Radar Receiver
- Lecture 48 - SAR Processing
- Lecture 49 - SAR Processing (Continued...)
- Lecture 50 - SAR Processing (Continued...)
- Lecture 51 - SAR Processor
- Lecture 52 - Tutorial
- Lecture 53 - Statistical Detection Theory
- Lecture 54 - Statistical Detection Theory (Continued...)
- Lecture 55 - Statistical Detection Theory (Continued...)
- Lecture 56 - Statistical Detection Theory (Continued...)
- Lecture 57 - Statistical Detection Theory (Continued...)
- Lecture 58 - Tutorial
- Lecture 59 - Ground Penetrating Radar
- Lecture 60 - GPR Measurements and Microwave Tomography

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

NPTEL Video Course - Electrical Engineering - NOC:Electrical Machines-I

Subject Co-ordinator - Prof.Tapas Kumar Bhattacharya

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Magnetic Circuit and Transformer
- Lecture 2 - Magnetising Current from B-H Curve
- Lecture 3 - Ideal Transformer, Dot Convention and Phasor Diagram
- Lecture 4 - Operation of Ideal Operation with Load Connected
- Lecture 5 - Equivalent Circuit of Ideal Transformer
- Lecture 6 - Rating of Single Phase Transformer
- Lecture 7 - Transformer with Multiple Coils
- Lecture 8 - Modelling of Practical Transformer - I
- Lecture 9 - Modelling of Practical Transformer - II
- Lecture 10 - Modelling of Practical Transformer - III
- Lecture 11 - Core Loss - Eddy Current Loss
- Lecture 12 - Factors on Eddy Current Loss Depends
- Lecture 13 - Hysteresis Loss
- Lecture 14 - Exact Equivalent Circuit
- Lecture 15 - Approximate Equivalent Circuit
- Lecture 16 - Determination of Equivalent Circuit Parameters - No Load Test
- Lecture 17 - Short Circuit Test
- Lecture 18 - Choosing Sides to Carry Out O.C / S.C Test
- Lecture 19 - Efficiency of Transformer - Losses
- Lecture 20 - Efficiency (Continued...)
- Lecture 21 - Condition for Maximum Efficiency When Load Power Factor Constant
- Lecture 22 - Family of Efficiency Curve at Various Power Factor and Energy Efficiency
- Lecture 23 - Load Description and Energy Efficiency
- Lecture 24 - Regulation
- Lecture 25 - Regulation
- Lecture 26 - Auto Transformer - Introduction
- Lecture 27 - AutoTransformer versus Two Winding Transformer
- Lecture 28 - AutoTransformer versus Two Winding Transformer (Continued...)
- Lecture 29 - Numerical Problems on Ideal Auto Transformer

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

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- Lecture 30 - Two Winding Transformer Connected as Auto Transformer
- Lecture 31 - Practical Auto Transformer
- Lecture 32 - Equivalent Circuit of an Auto Transformer
- Lecture 33 - Polarity Test and Sumpner Test
- Lecture 34 - 3 Phase Transformer Using 3 Single Phase Transformer
- Lecture 35 - Various Connections of 3-Phase Transformer - I
- Lecture 36 - Various Connections of 3-Phase Transformer - II
- Lecture 37 - Vector Group of 3-Phase Transformer
- Lecture 38 - Vector Group (Continued...)
- Lecture 39 - Open Delta Connection
- Lecture 40 - 3-Phase Core Type and Shell Type Transformer
- Lecture 41 - Zig Zag Connection
- Lecture 42 - Effect 3rd Harmonic Exciting Current and Flux
- Lecture 43 - Choosing Transformer Connection
- Lecture 44 - Choosing Transformer Connection (Continued...)
- Lecture 45 - Phase Conversion using Transformer
- Lecture 46 - Scott Connection (Continued...)
- Lecture 47 - 3 Phase to 6 Phase Conversion O.C / S.C Test on 3 Phase Transformer
- Lecture 48 - Parallel Operation of Transformers - I
- Lecture 49 - Parallel Operation of Transformers - II
- Lecture 50 - Parallel Operation of Transformers - III
- Lecture 51 - Specific Magnetic and Electric Loadings
- Lecture 52 - Cooling of Transformer and Fillings of Transformer
- Lecture 53 - Output Equation of 3- Phase Transformer
- Lecture 54 - Introduction to D.C Machine
- Lecture 55 - Single Conductor D.C Generator / Motor Operation
- Lecture 56 - Homopolar D.C Generator
- Lecture 57 - Homopolar D.C Motor
- Lecture 58 - Introduction to Rotating D.C Machines
- Lecture 59 - Armature Winding of D.C Machine - I
- Lecture 60 - Armature Winding of D.C Machine - II
- Lecture 61 - Armature Winding of D.C Machine - III
- Lecture 62 - Generated Voltage Across the Armature
- Lecture 63 - Electromagnetic Torque in D.C Machine
- Lecture 64 - Generator and Motor Operation - Basics
- Lecture 65 - O.C.C and Load Characteristic of Separately Excited Generators
- Lecture 66 - Voltage Build Up in Shunt Generator
- Lecture 67 - Load Characteristic of Shunt Generator
- Lecture 68 - Qualitative Discussion on Armature Reaction

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

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- Lecture 69 - Ill Effects of Armature Reaction
- Lecture 70 - Compensating and Interpoles
- Lecture 71 - Armature Reaction (Continued...)
- Lecture 72 - Field Flux Density, Armature Flux Density and Resultant Field Distribution
- Lecture 73 - Field Patterns for Both Motor and Generators
- Lecture 74 - Demagnetising and Cross Magnetising mmf for Brush Shifted Machine
- Lecture 75 - Calculation of Compensating, Interpole and Series Field Turns
- Lecture 76 - Estimating Armature and Field Resistance from its Rating
- Lecture 77 - Power Flow Diagram, Rotational Loss
- Lecture 78 - Shunt Motor
- Lecture 79 - Starting of D.C Motor - 3-Point Starter
- Lecture 80 - Speed Control of Shunt Motor - I
- Lecture 81 - Speed Control of Shunt Motor - II
- Lecture 82 - Speed Control of Shunt Motor - III
- Lecture 83 - Field Control (Continued...)
- Lecture 84 - D.C Motor Braking
- Lecture 85 - Introduction to Series Motor
- Lecture 86 - Series Motor Characteristics
- Lecture 87 - Series Motor Speed Control
- Lecture 88 - Universal Motor
- Lecture 89 - Swinburne Test
- Lecture 90 - Hopkinson Test
- Lecture 91 - Efficiency Calculation
- Lecture 92 - Field Test on D.C Series Motor
- Lecture 93 - Simplex Wave winding
- Lecture 94 - Wave Winding (Continued...)

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

NPTEL Video Course - Electrical Engineering - NOC:VLSI Signal Processing

Subject Co-ordinator - Prof. Mrityunjay Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Graphical Representation of Signals
- Lecture 2 - Signal Flow Graph
- Lecture 3 - Data Flow Graph, Critical Path
- Lecture 4 - Dependence Graph, Basics of Retiming
- Lecture 5 - Retiming Theorem
- Lecture 6 - Forward Path and Loop Retiming
- Lecture 7 - Loop Bound and Iteration Bound
- Lecture 8 - Cutset Retiming
- Lecture 9 - Retiming IIR Filters
- Lecture 10 - Adaptive Filter Basics (LMS Algorithm)
- Lecture 11 - Retiming LMS
- Lecture 12 - Retiming Delayed LMS
- Lecture 13 - Parallel Processing in DSP by Unfolding
- Lecture 14 - Basic Unfolding Relation
- Lecture 15 - Retiming for Unfolding
- Lecture 16 - Loop Unfolding
- Lecture 17 - Iteration bound for Loops
- Lecture 18 - Bitserial, Digit serial and Word serial Structures
- Lecture 19 - Unfolding a Switch
- Lecture 20 - Unfolding Bit Serial Systems
- Lecture 21 - Folding of DFG
- Lecture 22 - Folding Examples - IIR Filter
- Lecture 23 - Retiming for Folding
- Lecture 24 - Introduction to Delay Optimization by Folding
- Lecture 25 - Life Time Analysis of Storage Variables
- Lecture 26 - Forward Backward Data Allocation
- Lecture 27 - Life Time Analysis of Storage Variables in a Digital Filter
- Lecture 28 - Delay Folded Realization of a Digital Filter
- Lecture 29 - Polyphase Decomposition of Sequences

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

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- Lecture 30 - Hardware Efficient 2 - Parallel FIR Filters
- Lecture 31 - Hardware Efficient 3 - Parallel FIR Filters
- Lecture 32 - Introduction to First Level Architectures
- Lecture 33 - 2's Complement Number Systems
- Lecture 34 - Multiplication of Two Binary Numbers
- Lecture 35 - Carry Ripple and Carry Save Array
- Lecture 36 - Bit Serial Multipliers
- Lecture 37 - Bit Serial Digital Filters
- Lecture 38 - Baugh Wooley Multiplier
- Lecture 39 - Distributed Arithmetic

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

NPTEL Video Course - Electrical Engineering - NOC:Analog Electronic Circuits

Subject Co-ordinator - Prof. Pradip Mandal

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to the course
- Lecture 2 - Introduction to the constituent topics of the course and the Layout
- Lecture 3 - Revisit to pre-requisite topics
- Lecture 4 - Revisit to pre-requisite topics (Continued...)
- Lecture 5 - Analysis of Simple Non-Linear Circuit
- Lecture 6 - Analysis of Simple Non-linear Circuit (Continued...)
- Lecture 7 - Revisiting BJT Characteristic
- Lecture 8 - Revisiting BJT Characteristics (Continued...)
- Lecture 9 - Revisiting BJT Characteristics (Continued...)
- Lecture 10 - Revisiting MOSFET
- Lecture 11 - Revisiting MOSFET (Continued...)
- Lecture 12 - Revisiting MOSFET (Continued...)
- Lecture 13 - Revisiting MOSFET (Continued...)
- Lecture 14 - Analysis of simple non-linear circuit containing a BJT
- Lecture 15 - Analysis of simple non-linear circuit containing a BJT (Continued...)
- Lecture 16 - Analysis of simple non-linear circuit containing a MOSFET
- Lecture 17 - Analysis of simple non-linear circuit containing a MOSFET (Continued...)
- Lecture 18 - Linearization of non-linear circuit containing BJT
- Lecture 19 - Linearization of non-linear circuit containing BJT (Continued...)
- Lecture 20 - Linearization of non-linear circuit containing MOSFET
- Lecture 21 - Linearization of non-linear circuit containing MOSFET (Continued...)
- Lecture 22 - Linear models of Amplifiers - Part A
- Lecture 23 - Linear models of Amplifiers - Part B
- Lecture 24 - Common Emitter Amplifier - Part A
- Lecture 25 - Common Emitter Amplifier - Part B
- Lecture 26 - Common Emitter Amplifier (Continued...) - Part A
- Lecture 27 - Common Emitter Amplifier (Continued...) - Part B
- Lecture 28 - Common Emitter Amplifier (Continued...) - Numerical examples - Part A
- Lecture 29 - Common Emitter Amplifier (Continued...) - Numerical examples - Part B

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

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- Lecture 30 - Common Emitter Amplifier (Continued...) - Design guidelines - Part A
- Lecture 31 - Common Emitter Amplifier (Continued...) - Design guidelines - Part B
- Lecture 32 - Common Source Amplifier - Part A
- Lecture 33 - Common Source Amplifier - Part B
- Lecture 34 - Common Source Amplifier (Continued...) Numerical examples and design guidelines - Part B
- Lecture 35 - Frequency Response of CE and CS Amplifiers - Part A
- Lecture 36 - Frequency Response of CE and CS Amplifiers - Part B
- Lecture 37 - Frequency Response of CE and CS Amplifiers - Part C
- Lecture 38 - Frequency Response of CE and CS Amplifiers (Continued...) - Part A
- Lecture 39 - Frequency Response of CE And CS Amplifiers (Continued...) - Part B
- Lecture 40 - Frequency Response of CE/CS Amplifiers Considering High Frequency Models of BJT and MOSFET - Part A
- Lecture 41 - Frequency Response of CE/CS Amplifiers Considering High Frequency Models of BJT and MOSFET - Part B
- Lecture 42 - Frequency Response of CE/CS Amplifiers Considering High Frequency Models of BJT And MOSFET - Part C
- Lecture 43 - Limitation of CE and CS Amplifiers in Cascading
- Lecture 44 - Common Collector and Common Drain Amplifiers
- Lecture 45 - Common Collector and Common Drain Amplifiers (Continued...)
- Lecture 46 - Common Collector and Common Drain Amplifiers (Continued...)
- Lecture 47 - Common Collector and Common Drain Amplifiers (Continued...)
- Lecture 48 - Common Collector and Common Drain Amplifiers (Continued...)
- Lecture 49 - Common Base and Common Gate Amplifiers
- Lecture 50 - Common Base and Common Gate Amplifiers
- Lecture 51 - Common Base and Common Gate Amplifiers (Continued...)
- Lecture 52 - Common Base and Common Gate Amplifiers (Continued...)
- Lecture 53 - Common Base and Common Gate Amplifiers (Continued...)
- Lecture 54 - Common Base and Common Gate Amplifiers (Continued...)
- Lecture 55 - Multi-Transistor Amplifiers
- Lecture 56 - Multi-Transistor Amplifiers
- Lecture 57 - Multi-Transistor Amplifiers
- Lecture 58 - Multi-Transistor Amplifiers (Continued...)
- Lecture 59 - Multi-Transistor Amplifiers (Continued...)
- Lecture 60 - Multi-Transistor Amplifiers (Continued...)
- Lecture 61 - Multi-Transistor Amplifiers
- Lecture 62 - Multi-Transistor Amplifiers
- Lecture 63 - Multi-Transistor Amplifiers
- Lecture 64 - Multi-Transistor Amplifiers
- Lecture 65 - Multi-Transistor Amplifiers
- Lecture 66 - Multi-Transistor Amplifiers
- Lecture 67 - Multi-Transistor Amplifiers
- Lecture 68 - Multi-Transistor Amplifiers

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

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- Lecture 69 - Multi-Transistor Amplifiers
- Lecture 70 - Single-ended Vs Differential Signaling and Basic Model of a Differential Amplifier
- Lecture 71 - Single-ended Vs Differential Signaling and Basic Model of a Differential Amplifier (Continued...)
- Lecture 72 - Single-ended Vs Differential Signaling and Basic Model of a Differential Amplifier (Continued...)
- Lecture 73 - Single-ended Vs Differential Signaling and Basic Model of a Differential Amplifier (Continued...)
- Lecture 74 - Single-ended Vs Differential Signaling and Basic Model of a Differential Amplifier (Continued...)
- Lecture 75 - Differential Amplifier
- Lecture 76 - Differential Amplifier
- Lecture 77 - Differential Amplifier
- Lecture 78 - Differential Amplifier
- Lecture 79 - Differential Amplifier
- Lecture 80 - Differential Amplifier
- Lecture 81 - Current mirror circuits - Part A
- Lecture 82 - Current mirror circuits - Part B
- Lecture 83 - Usage of current mirror - Part A
- Lecture 84 - Usage of current mirror - Part B
- Lecture 85 - Usage of current mirror - Part C
- Lecture 86 - Numerical examples on current mirror and its applications - Part A
- Lecture 87 - Numerical examples on current mirror and its applications - Part B
- Lecture 88 - Numerical examples on current mirror and its applications - Part C
- Lecture 89 - Numerical examples on current mirror and its applications - Part D
- Lecture 90 - Feedback system - Part A
- Lecture 91 - Feedback system - Part B
- Lecture 92 - Feedback system - Part C
- Lecture 93 - Feedback system - Part D
- Lecture 94 - Feedback system - Part E
- Lecture 95 - Effect of feedback on frequency response - Part A
- Lecture 96 - Effect of feedback on frequency response - Part B
- Lecture 97 - Applications of feedback in amplifier circuits - Part A
- Lecture 98 - Applications of feedback in amplifier circuits - Part B
- Lecture 99 - Applications of feedback in amplifier circuits - Part C

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

NPTEL Video Course - Electrical Engineering - NOC:Network Analysis

Subject Co-ordinator - Prof. T.K. Bhattacharya

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Voltage and Current Sources
- Lecture 3 - Simple Networks with Voltage and Current Sources
- Lecture 4 - Mesh Analysis - I
- Lecture 5 - Mesh Analysis - II
- Lecture 6 - Nodal Analysis - I
- Lecture 7 - Nodal Analysis - II
- Lecture 8 - Nodal Analysis - III
- Lecture 9 - Inductor - I
- Lecture 10 - Initial Condition for Inductor
- Lecture 11 - Energy Stored in Inductor with Example
- Lecture 12 - R-L Series Circuit Analysis
- Lecture 13 - Retrieving Energy or Discharging of Inductor Energy
- Lecture 14 - Capacitor
- Lecture 15 - Charging of a Capacitor - Voltage, Current and Energy During Charging
- Lecture 16 - Discharge of a Charged Capacitor
- Lecture 17 - Linearity of R,L,C - Inductor with Initial Current and Capacitor with Initial Voltage
- Lecture 18 - General Method for Solving Linear Differential Equation - I
- Lecture 19 - General Method for Solving Linear Differential Equation - II
- Lecture 20 - General Method for Solving Linear Differential Equation - III
- Lecture 21 - Problem Solving
- Lecture 22 - R-L Circuit with Sinusoidal Excitation
- Lecture 23 - R-C Circuit with Sinusoidal Exponential
- Lecture 24 - Solution Due to Exponential Forcing Function
- Lecture 25 - Mesh and Nodal Analysis with Time Varying Source
- Lecture 26 - Circuit Analysis with Phasor - I
- Lecture 27 - Circuit Analysis with Phasor - II
- Lecture 28 - Circuit Analysis with Phasor - III
- Lecture 29 - Concept of Active and Reactive Power in A.C Circuit - I

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

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- Lecture 30 - Concept of Active and Reactive Power in A.C Circuit - II
- Lecture 31 - Expression for Complex Power in A.C Circuit
- Lecture 32 - Numerical Example
- Lecture 33 - Mesh and Nodal Analysis in A.C Circuit, Introduction to Impulse Function
- Lecture 34 - Odd and Even Functions, Relation between Unit Step and Impulse Function
- Lecture 35 - Solution of Differential Equation with Impulse Excitation
- Lecture 36 - Numerical Example when Excitation is Impulse
- Lecture 37 - Self and Mutual Inductances - I
- Lecture 38 - Dot Convention in Mutually Coupled Coils
- Lecture 39 - Mutually Coupled Coils in Series and Parallel
- Lecture 40 - Energy Stored in Mutually Coupled Coils
- Lecture 41 - Steady State Response with Sinusoidal Excitation when the Coils are Mutually Coupled
- Lecture 42 - Basics of Signals in Brief
- Lecture 43 - Laplace Transform - I
- Lecture 44 - Laplace Transform - II
- Lecture 45 - Laplace Transform Applied to Circuit Analysis - I
- Lecture 46 - Laplace Transform Applied to Circuit Analysis - II
- Lecture 47 - Numerical Examples - I
- Lecture 48 - Numerical Examples - II
- Lecture 49 - General Second Order Circuit Analysis with L.T - I
- Lecture 50 - General Second Order Circuit Analysis with L.T - II
- Lecture 51 - Network Theorem - I
- Lecture 52 - Network Theorem - II
- Lecture 53 - Norton's Theorem
- Lecture 54 - Thevenin Theorem
- Lecture 55 - Star-Delta and Delta-Star Transformation
- Lecture 56 - Telligem's Theorem
- Lecture 57 - Reciprocity Theorem
- Lecture 58 - Maximum Power Transfer Theorem
- Lecture 59 - Graph Theory Applied to Network Analysis - I
- Lecture 60 - Graph Theory Applied to Network Analysis - II
- Lecture 61 - Graph Theory Applied to Network Analysis - III
- Lecture 62 - Graph Theory Applied to Network Analysis - IV
- Lecture 63 - Graph Theory Applied to Network Analysis - V
- Lecture 64 - Mesh Analysis with Graph Theory
- Lecture 65 - Nodal Analysis with Graph Theory
- Lecture 66 - Cut-Set Analysis with Graph Theory
- Lecture 67 - Numerical Examples of Network Analysis with Graph Theory
- Lecture 68 - Circuit Analysis with Dependent Sources - I

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

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- Lecture 69 - Circuit Analysis with Dependent Sources - II
- Lecture 70 - Circuit Analysis with Dependent Sources - III
- Lecture 71 - Two Port Network - I
- Lecture 72 - Two Port Network - II
- Lecture 73 - Two Port Network - III
- Lecture 74 - Two Port Network - IV
- Lecture 75 - Two Port Network - V
- Lecture 76 - Two Port Network - VI
- Lecture 77 - Two Port Network - VII
- Lecture 78 - Gyrator
- Lecture 79 - Ideal Op - Amp
- Lecture 80 - Examples of Ideal Op-Amp Circuits - I
- Lecture 81 - Examples of Ideal Op-Amp Circuits - II
- Lecture 82 - General Impedance Transfer Circuit and Concluding Remarks

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

NPTEL Video Course - Electrical Engineering - NOC:Power System Protection

Subject Co-ordinator - Prof. Ashok Kumar Pradhan

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Faults in Power System
- Lecture 2 - Elements and Features of Protection Scheme
- Lecture 3 - Fault Analysis Review - Sequence Components
- Lecture 4 - Fault Analysis Review - Sequence Components (Continued...)
- Lecture 5 - Numerical Relaying Concept
- Lecture 6 - Discrete Fourier Transform
- Lecture 7 - Recursive and Half Cycle DFT and Cosine Filter
- Lecture 8 - Least Square Technique
- Lecture 9 - Frequency Response of Phasor Estimation techniques
- Lecture 10 - In the Presence of Decaying DC
- Lecture 11 - Overcurrent Relay Characteristics
- Lecture 12 - Overcurrent Relay Coordination
- Lecture 13 - Relay Coordination with Fuse
- Lecture 14 - Introduction to Directional Relaying
- Lecture 15 - Positive Sequence Directional Relay
- Lecture 16 - Negative and Zero Sequence Directional Relay
- Lecture 17 - Superimposed Component Based Directional Relaying
- Lecture 18 - Introduction to Distance Relay
- Lecture 19 - Fault Classification
- Lecture 20 - Apparent Impedance Calculation
- Lecture 21 - Distance Relay Implementation
- Lecture 22 - Application to Double Circuit Line
- Lecture 23 - Multi-terminal Lines
- Lecture 24 - Protection of series compensated lines - Part I
- Lecture 25 - Protection of series compensated lines - Part II
- Lecture 26 - Effect of Fault Resistance
- Lecture 27 - Load Encroachment
- Lecture 28 - Power Swing
- Lecture 29 - Power Swing Detection Techniques - Part I

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

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- Lecture 30 - Power Swing Detection Techniques - Part II
- Lecture 31 - Adaptive Distance Relaying
- Lecture 32 - Communication Assisted Relaying Scheme
- Lecture 33 - Current Transformer - Part I
- Lecture 34 - Current Transformer - Part II
- Lecture 35 - Capacitor Voltage Transformer
- Lecture 36 - Fiber Optic Sensors
- Lecture 37 - Introduction to Transformer Protection
- Lecture 38 - Differential Relay
- Lecture 39 - Steps in Differential Relay Processing
- Lecture 40 - Inrush Detection
- Lecture 41 - CT Saturation, Negative Sequence Differential and Restricted Earth Fault Relay
- Lecture 42 - Line Differential - Part I
- Lecture 43 - Line Differential - Part II
- Lecture 44 - Busbar Protection
- Lecture 45 - Fault Characteristics of Renewable Sources
- Lecture 46 - Protection Challenges of Distribution Systems with Renewables
- Lecture 47 - Protection challenges of transmission systems with renewables
- Lecture 48 - Traveling Wave Basics
- Lecture 49 - Protection using Travelling Waves
- Lecture 50 - Fault Location using Travelling Wave
- Lecture 51 - Wide Area Measurement Basics
- Lecture 52 - Wide Area Measurement for Protection

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

NPTEL Video Course - Electrical Engineering - NOC:Signal Processing for mm Wave communication for 5G and beyond

Subject Co-ordinator - Prof. Amit Kumar Dutta

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Tx- Rx Structure

Lecture 2 - Rx -Structure

Lecture 3 - Fundamental of Ray-Tracing model

Lecture 4 - General channel model - Part I

Lecture 5 - General channel model - Part I (Continued...)

Lecture 6 - General channel model - Part I (Continued...)

Lecture 7 - General channel model - Part II

Lecture 8 - Wireless channel-A ray tracing model - Part II

Lecture 9 - Wireless channel-A ray tracing model - Part II (Continued...)

Lecture 10 - Wireless channel-A ray tracing model - Part II (Continued...)

Lecture 11 - Wireless channel-A ray tracing model - Part II (Continued...)

Lecture 12 - RMS Delay spread and Doppler Effect on channel

Lecture 13 - Time Varing Model

Lecture 14 - Doppler Impact on coherence BW

Lecture 15 - Introduction to time series

Lecture 16 - AR,ARMA,MA process

Lecture 17 - Doppler with AR process model

Lecture 18 - Coherence time and parameter summery

Lecture 19 - Basic ISI channel

Lecture 20 - Channel estimation and Equalizer

Lecture 21 - precoder and MIMO

Lecture 22 - precoder and MIMO (Continued...)

Lecture 23 - Basics of mmwave spectrum

Lecture 24 - Angle of arrival and angle of departure

Lecture 25 - 3D concepts, AoA,AoD

Lecture 26 - mmWave channel model with RX beaming

Lecture 27 - mmWave channel model with RX beaming (Continued...)

Lecture 28 - mmWave channel model with RX beaming (Continued...)

Lecture 29 - mmWave channel model with RX beaming (Continued...)

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

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- Lecture 30 - mmwave channel model (Continued...)
- Lecture 31 - mmWave channel model (Continued...) -Tx side multiple antenna
- Lecture 32 - Basics of Beamforming
- Lecture 33 - Single Antenna beamforming
- Lecture 34 - Concept of antenna many fold vector
- Lecture 35 - 3D Concept of antenna many fold vector
- Lecture 36 - Different Geometry of antenna from electrical point of view
- Lecture 37 - Basics of Beamforming pattern - Part I
- Lecture 38 - Basics of Beamforming pattern - Part II
- Lecture 39 - SISO Beamforming
- Lecture 40 - MIMO Beamforming
- Lecture 41 - Structural implementation of MIMO Beamforming
- Lecture 42 - Different Level of Beamforming
- Lecture 43 - MIMO Beamforming in Transmitter side
- Lecture 44 - MIMO Beamforming in Receiver side - Part I
- Lecture 45 - MIMO Beamforming in Receiver side - Part II
- Lecture 46 - Mathematical description of MIMO Beamforming (Continued...)
- Lecture 47 - Equalizer based detector
- Lecture 48 - Parameter to be designed in MIMO Beamforming
- Lecture 49 - OFDM Data Model
- Lecture 50 - OFDM Data model (Continued...)
- Lecture 51 - General OFDM
- Lecture 52 - OFDM spectrum and CFO
- Lecture 53 - MIMO OFDM structure
- Lecture 54 - MIMO OFDM decode and beamforming
- Lecture 55 - Design parameter estimation - Part 1
- Lecture 56 - Design parameter estimation - Part 2
- Lecture 57 - Design parameter estimation - Part 3
- Lecture 58 - Design parameter estimation - Part 4
- Lecture 59 - Design parameter estimation - Part 5
- Lecture 60 - MU System
- Lecture 61 - CFO and other impairment and their effects
- Lecture 62 - Multi User Hybrid beam and impairment and analysis - Part 3
- Lecture 63 - Multi User Hybrid beam and Impairment and analysis - Part 4
- Lecture 64 - Multi User Hybrid beam and Impairment and analysis - Part 5

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

NPTEL Video Course - Electrical Engineering - NOC:Control and Tuning Methods in Switched Mode Power Converter

Subject Co-ordinator - Prof. Santanu Kapat

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - DC Power Conversion Systems - Introduction
- Lecture 2 - Overview of voltage regulators
- Lecture 3 - Switched mode power converter (SMPC)
- Lecture 4 - Model Development for MATLAB Simulation
- Lecture 5 - Demonstration of MATLAB Simulation
- Lecture 6 - Demonstration of MATLAB Simulation (Continued...)
- Lecture 7 - Power Stage Design of Basic SMPCs: Summary
- Lecture 8 - Fixed Frequency Modulation Techniques
- Lecture 9 - Variable Frequency Modulation Techniques
- Lecture 10 - Modulation in Discontinuous Conduction Mode (DCM)
- Lecture 11 - Synchronizing Simulation and Script files in MATLAB
- Lecture 12 - Interactive MATLAB Simulation and Case Studies
- Lecture 13 - Converter's Objectives and Control Implications
- Lecture 14 - Feedforward Control in SMPC
- Lecture 15 - Single and Multi Loop Feedback Control Methods
- Lecture 16 - Feedback Control of Cascaded SMPCs
- Lecture 17 - Combined feedback and feedforward control
- Lecture 18 - State feedback control
- Lecture 19 - Variable Frequency Control - Understanding Opportunities and Challenges
- Lecture 20 - Constant On-time Control Methods
- Lecture 21 - Constant Off-time Control Methods
- Lecture 22 - Hysteresis Control Methods in SMPCs
- Lecture 23 - Stability and Performance Comparison using MATLAB Simulation
- Lecture 24 - Light Load Control Methods and Interactive MATLAB Simulation
- Lecture 25 - Overview of Modeling Techniques
- Lecture 26 - State space averaging and model validation
- Lecture 27 - Circuit Averaging Techniques and Equivalent Circuit
- Lecture 28 - DC Analysis using Equivalent Circuit Model
- Lecture 29 - Derivation of Small-Signal Transfer Functions

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

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- Lecture 30 - Small-Signal Model Validation using MATLAB and Time Domain Correlation
- Lecture 31 - Small-signal Modeling with Closed Current Loop
- Lecture 32 - Impedance Analysis and Stability
- Lecture 33 - Loop Gain Analysis and Understanding Model Limits using MATLAB
- Lecture 34 - PID Control Design and Tuning under VMC with MATLAB Case Studies
- Lecture 35 - Shaping Output Impedance of a Buck Converter under VMC
- Lecture 36 - Design of VMC Boost Converter and MATLAB Design Case Studies
- Lecture 37 - Accurate Small-signal Modelling under CMC and Verification using MATLAB
- Lecture 38 - Design CMC in a Buck Converter and MATLAB based Model Validation
- Lecture 39 - Design of CMC Boost Converter - Output and State Feedback Approaches
- Lecture 40 - Loop Interactions in CMC and Design of Average CMC
- Lecture 41 - Dynamics of SMPCs and Overview of Model-based Nonlinear Control
- Lecture 42 - Dynamics of LTIs and Vector Field with MATLAB Demonstration
- Lecture 43 - Geometric Perspectives of Eigenvalues and Eigenvectors in SMPCs
- Lecture 44 - Small-signal and Large-signal Model based Nonlinear Control
- Lecture 45 - Introduction to Sliding Mode Control in SMPCs
- Lecture 46 - Sliding Mode Control Design in a Buck Converter
- Lecture 47 - Boundary Control Techniques and Selection of Switching Surfaces
- Lecture 48 - Time Optimal Control and Identifying Physical Limits in SMPCs
- Lecture 49 - Linking Switching Boundary and PID Controller Structure in SMPCs
- Lecture 50 - Large-Signal Controller Tuning in Buck Converter: Objectives and Derivations
- Lecture 51 - Large-Signal Controller Tuning in Boost and Buck-Boost Converters
- Lecture 52 - Large-Signal Controller Tuning in Fixed- and Variable-Frequency Control
- Lecture 53 - Critical Performance Limits in Dynamic Voltage Scaling and Possible Solutions
- Lecture 54 - Nonlinear Control vs. Large-Signal Tuning: Comparative Study using MATLAB
- Lecture 55 - Small-Signal vs. Large-Signal Tuning: Comparison using MATLAB Simulation
- Lecture 56 - Performance Improvement and Size Reduction using Large-Signal based Control
- Lecture 57 - Digital Control in High Frequency SMPCs - Introduction and Motivations
- Lecture 58 - Overview of Fixed and Variable Frequency Digital Control Architectures
- Lecture 59 - Challenges and Opportunities in Digitally Controlled High Frequency SMPCs
- Lecture 60 - Course Summary, Key Takeaways, Few Emerging Applications and Future Scopes



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

NPTEL Video Course - Electrical Engineering - NOC:Advanced Microwave Guided-Structures and Analysis

Subject Co-ordinator - Prof. Bratin Ghosh

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Scattering Matrix Concepts
- Lecture 2 - Scattering Matrix Concepts (Continued...)
- Lecture 3 - Scattering Matrix Concepts (Continued...)
- Lecture 4 - Scattering Matrix Concepts (Continued...)
- Lecture 5 - Scattering Matrix Concepts Tutorials
- Lecture 6 - Scattering Matrix Concepts Tutorials (Continued...)
- Lecture 7 - Scattering Matrix Concepts Tutorials (Continued...)
- Lecture 8 - Instantaneous form of Maxwell's equations
- Lecture 9 - Instantaneous form of Maxwell's equations (Continued...)
- Lecture 10 - Instantaneous form of Maxwell's equations (Continued...)
- Lecture 11 - Instantaneous form of Maxwell's equations (Continued...)
- Lecture 12 - Instantaneous form of Maxwell's equations (Continued...)
- Lecture 13 - Instantaneous form of Maxwell's equations Tutorials
- Lecture 14 - Instantaneous form of Maxwell's equations Tutorials (Continued...)
- Lecture 15 - Harmonic form of Maxwell's equations
- Lecture 16 - Harmonic form of Maxwell's equations (Continued...)
- Lecture 17 - Harmonic form of Maxwell's equations (Continued...)
- Lecture 18 - Harmonic form of Maxwell's equations Tutorials
- Lecture 19 - Wave Equation and Solution
- Lecture 20 - Relation between wavenumbers
- Lecture 21 - Radiation from an electric current source (Continued...)
- Lecture 22 - Radiation from an electric current source (Continued...)
- Lecture 23 - Radiation from an electric current source (Continued...)
- Lecture 24 - Wave Equation and Solution Tutorials
- Lecture 25 - Radiation from an electric current source Tutorials
- Lecture 26 - Radiation from a magnetic current source
- Lecture 27 - Radiation from a magnetic current source (Continued...)
- Lecture 28 - Radiation from a magnetic current source (Continued...)
- Lecture 29 - Application of the magnetic current source (Continued...)

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

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- Lecture 30 - Radiation from a magnetic current source Tutorials
- Lecture 31 - Radiation from a magnetic current source Tutorials (Continued....)
- Lecture 32 - Rectangular waveguide - I
- Lecture 33 - Rectangular waveguide - I Tutorials
- Lecture 34 - Rectangular waveguide - II
- Lecture 35 - Rectangular waveguide - II (Continued...)
- Lecture 36 - Rectangular waveguide - II Tutorials
- Lecture 37 - Rectangular waveguide - II Tutorials (Continued...)
- Lecture 38 - Rectangular cavity resonator
- Lecture 39 - Rectangular cavity resonator Tutorials
- Lecture 40 - Rectangular cavity resonator Tutorials (Continued...)
- Lecture 41 - The Reciprocity Theorem, Computation of Amplitudes of Forward and Backward (Continued...)
- Lecture 42 - The Reciprocity Theorem, Computation of Amplitudes of Forward and Backward (Continued...)
- Lecture 43 - The Reciprocity Theorem, Computation of Amplitudes Tutorials
- Lecture 44 - The Reciprocity Theorem, Computation of Amplitudes Tutorials (Continued...)
- Lecture 45 - Analysis of Guided Structures
- Lecture 46 - Analysis of Guided Structures (Continued...)
- Lecture 47 - Analysis of Guided Structures (Continued...)
- Lecture 48 - Analysis of Guided Structures (Continued...)
- Lecture 49 - Analysis of Guided Structures (Continued...)
- Lecture 50 - Analysis of Guided Structures (Continued...)
- Lecture 51 - Analysis of Guided Structures (Continued...)
- Lecture 52 - Analysis of Guided Structures (Continued...)
- Lecture 53 - Analysis of Guided Structures (Continued...)
- Lecture 54 - Analysis of Guided Structures (Continued...)
- Lecture 55 - Analysis of Guided Structures (Continued...)
- Lecture 56 - Analysis of Guided Structures (Continued...)
- Lecture 57 - Analysis of Guided Structures Tutorials
- Lecture 58 - Analysis of Guided Structures Tutorials (Continued...)
- Lecture 59 - Cylindrical Wave Functions
- Lecture 60 - Cylindrical Wave Functions (Continued...)
- Lecture 61 - Cylindrical Wave Functions (Continued...)
- Lecture 62 - Circular Waveguide
- Lecture 63 - Circular Cavity
- Lecture 64 - Cylindrical Wave Functions Tutorials
- Lecture 65 - Cylindrical Wave Functions Tutorials (Continued...)
- Lecture 66 - Application to the Coupling Problem : Aperture-Coupled, Probe-Coupled and Waveguide
- Lecture 67 - Application to the Coupling Problem : Aperture-Coupled, Probe-Coupled and Waveguide (Continued...)
- Lecture 68 - Application to the Coupling Problem : Aperture-Coupled, Probe-Coupled and Waveguide (Continued...)

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Lecture 69 - Application to the Coupling Problem : Aperture-Coupled, Probe-Coupled and Waveguide (Continued..)

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

NPTEL Video Course - Electrical Engineering - NOC:Cognition and its Computation

Subject Co-ordinator - Prof. Rajlakshmi Guha, Prof. Sharba Bandyopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Historical Origin of Cognition Studies
- Lecture 3 - The Cognitive Revolution
- Lecture 4 - Anatomical Structures of the Brain
- Lecture 5 - Frontal Lobes and Cognition
- Lecture 6 - Neuropsychological Testing
- Lecture 7 - Eye Tracking and Cognition
- Lecture 8 - EEG, fMRI, MEG
- Lecture 9 - Single neuron level measurements
- Lecture 10 - Single Neuron Imaging and Manipulation of Neural Activity
- Lecture 11 - Introduction to Computation
- Lecture 12 - Currency of Computation in Neurobiology - Action Potential
- Lecture 13 - Synapse and Synaptic Transmission
- Lecture 14 - Synaptic Plasticity
- Lecture 15 - Short Term Plasticity and STDP
- Lecture 16 - Coding by neurons
- Lecture 17 - Sensory Circuits: Visual - I
- Lecture 18 - Sensory Circuits: Visual - II
- Lecture 19 - Sensory Circuits: Auditory - I
- Lecture 20 - Sensory Circuits: Auditory - II
- Lecture 21 - Sensory Circuits: Somatosensory
- Lecture 22 - Sensory Circuits: Olfactory and Gustatory
- Lecture 23 - Motor circuits - Sensory-motor
- Lecture 24 - Reward Circuits
- Lecture 25 - Executive Circuits
- Lecture 26 - Types of Attention, Theories Broadbent Triessman
- Lecture 27 - Alerting Orientation and Executive Network
- Lecture 28 - Disorders of Attention
- Lecture 29 - Basics of Perception - Object, Depth and Movement

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

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- Lecture 30 - Constancy and Illusions
- Lecture 31 - Neurobiology of attention, Working Memory
- Lecture 32 - Cholinergic System, Bottom up and Top down
- Lecture 33 - Object Recognition
- Lecture 34 - Visual Search and Pattern Recognition
- Lecture 35 - Auditory Scene Analysis, McGurk Effect
- Lecture 36 - Learning Processes
- Lecture 37 - Learning Processes (Continued...)
- Lecture 38 - Memory
- Lecture 39 - Learning Disorders
- Lecture 40 - Memory Failure - Forgetting
- Lecture 41 - Learning in biological neural networks
- Lecture 42 - Examples
- Lecture 43 - Different types of Plasticity
- Lecture 44 - Developmental Plasticity/Learning/Critical Period
- Lecture 45 - Examples of Disorders in Plasticity
- Lecture 46 - Introduction to speech and language (Development)
- Lecture 47 - Components of Speech, Speech Production
- Lecture 48 - Speech Perception
- Lecture 49 - Lessons from Animal Communication
- Lecture 50 - Language and Thought - Speech Language Disorders
- Lecture 51 - Theories of Emotion
- Lecture 52 - Neurophysiology of emotions - Limbic System
- Lecture 53 - Problem Solving
- Lecture 54 - Decision Making
- Lecture 55 - Frontal cortex in decision making
- Lecture 56 - Topics in current research - I
- Lecture 57 - Topics in current research - II
- Lecture 58 - Topics in current research - III
- Lecture 59 - Topics in current research - IV
- Lecture 60 - Topics in current research - V

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

NPTEL Video Course - Electrical Engineering - NOC:Digital Control in Switched Mode Power Converters and FPGA-

Subject Co-ordinator - Prof. Santanu Kapat

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Digital Control in Switched Mode Power Converters - Course Introduction
- Lecture 2 - Digital Control of SMPCs - Course Instructions, Guidelines and Resources
- Lecture 3 - Examples of Some Commercial Digital Control Solutions
- Lecture 4 - Overview of Digital Control Implementation Platforms
- Lecture 5 - Introducing Basic Digitization in Power Electronic Converters
- Lecture 6 - Recap of Feedback and Feedforward Control Methods in SMPCs
- Lecture 7 - Recap of Fixed and Variable Frequency Modulation Techniques
- Lecture 8 - Levels of Digitization in Single-loop Feedback Control in SMPCs
- Lecture 9 - Levels of Digitization in Multi-loop Feedback Control in SMPCs
- Lecture 10 - SMPC Topologies and Power Stage Design for Hardware Demonstrations
- Lecture 11 - Basics of Sampling under Fixed and Variable Frequency Modulation
- Lecture 12 - Voltage Mode Digital Pulse Width Modulators and Sampling Methods
- Lecture 13 - Overview of Digital Pulse Width Modulator Architectures
- Lecture 14 - Sampling Methods under Fixed Frequency Current Mode Control
- Lecture 15 - Overview of Fixed Frequency Current Mode Control Architectures
- Lecture 16 - Sampling Methods under Constant On/Off - Time Digital Modulation
- Lecture 17 - Constant On/Off- Time Mixed-Signal Current Mode Control Architectures
- Lecture 18 - Sampling Methods under Digital Hysteresis Control Methods
- Lecture 19 - Overview of Digital Hysteresis Control Architectures
- Lecture 20 - Summary of Digital Current Mode Control Architectures
- Lecture 21 - Recap of Voltage and Current Mode Control Implementation using MATLAB
- Lecture 22 - MATLAB Model Development for Basic Digital Control Blocks
- Lecture 23 - MATLAB Model Development for Fixed Frequency Digital Control
- Lecture 24 - MATLAB Models for Digital Controllers using Difference Equations
- Lecture 25 - MATLAB Model Development for Digital Voltage Mode Control
- Lecture 26 - MATLAB Model Development for Mixed-Signal Current Mode Control
- Lecture 27 - MATLAB Model Development for Fully Digital Current Mode Control
- Lecture 28 - MATLAB Model Development for Constant-On Time Control
- Lecture 29 - MATLAB Model Development for Constant-Off Time Control

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

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- Lecture 30 - MATLAB Model Development for Digital Current Hysteresis Control
- Lecture 31 - Continuous-Time Small-Signal Modeling under Digital Control
- Lecture 32 - Discrete Time Modeling with Closed Current Loop
- Lecture 33 - State-Space Modeling and Steps For Deriving Discrete-Time Models
- Lecture 34 - Derivation of Discrete-Time Large-Signal Models
- Lecture 35 - Validation of Discrete-Time Large-Signal Models using MATLAB - Part I
- Lecture 36 - Validation of Discrete-Time Large-Signal Models using MATLAB - Part II
- Lecture 37 - Derivation of Discrete-Time Small-Signal Models - I
- Lecture 38 - Derivation of Discrete-Time Small-Signal Models - II
- Lecture 39 - Discrete-Time Transfer Functions and Closed Loop Block Diagrams
- Lecture 40 - Model Accuracy with MATLAB Case Studies - Comparative Study
- Lecture 41 - Continuous-Time to Discrete-Time Conversion Methods - A Summary
- Lecture 42 - Recap of Frequency Domain Design of Analog VMC and CMC
- Lecture 43 - Design under Digital Voltage Mode Control - Frequency Domain Approaches
- Lecture 44 - Design under Digital Current Mode Control - Frequency Domain Approaches
- Lecture 45 - Design Case Study and MATLAB Simulation of Digital Voltage Mode Control
- Lecture 46 - Design Case Study and MATLAB Simulation of Digital Current Mode Control
- Lecture 47 - Time Optimal Control of a Buck Converter and Identifying Performance Limits
- Lecture 48 - Trajectory based CMC Design for Proximate Time Optimal Recovery
- Lecture 49 - Trajectory based Digital CMC Tuning and MATLAB Case Studies
- Lecture 50 - Digital Pulse Skipping Control and MATLAB Simulation Case Studies
- Lecture 51 - Selection of ADC and DAC in Digitally Controlled SMPCs
- Lecture 52 - High Frequency Current Sensing Techniques in Digitally Controlled SMPCs
- Lecture 53 - Current Sensing Techniques in Digitally Controlled High Power Converters
- Lecture 54 - Signal Conditioning Circuits and PCB Design for Mixed-Signal Implementation
- Lecture 55 - Reference Power Stage Design and Schematic for Buck and Boost Converters - I
- Lecture 56 - Reference Power Stage Design and Schematic for Buck and Boost Converters - II
- Lecture 57 - Step-by-Step Guidelines for Digital Control Implementation using FPGA
- Lecture 58 - Test and Measurement of a Buck Converter using Digital Storage Oscilloscope
- Lecture 59 - Functionalities in Mixed Signal Oscilloscope for Validating Digital Control
- Lecture 60 - Power Spectrum Analysis of SMPCs using Mixed-Signal Oscilloscope
- Lecture 61 - Introduction to Verilog Hardware Description Language (HDL)
- Lecture 62 - Guidelines for Verilog HDL Programming - Some Key Rules
- Lecture 63 - Structural and Dataflow Modeling in Verilog HDL for Combinational Logics
- Lecture 64 - Behavioral Modeling in Verilog HDL for Sequential Digital Circuits
- Lecture 65 - Simulation of Verilog-HDL based Design using Xilinx Webpack - I
- Lecture 66 - Simulation of Verilog-HDL based Design using Xilinx Webpack - II
- Lecture 67 - Fixed Point Implementation in Embedded Control System
- Lecture 68 - Fixed Point Arithmetic and Concept of Q Format

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

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- Lecture 69 - Counter-based DPWM with Deadtime and Verilog HDL Programming
- Lecture 70 - Simulating Counter-based DPWM with Deadtime using Xilinx ISE Simulator
- Lecture 71 - Top Down Design Methodology in Digital Voltage Mode Control - I
- Lecture 72 - Top Down Design Methodology in Digital Voltage Mode Control - II
- Lecture 73 - Digital PID Control Implementation using Verilog HDL Programming
- Lecture 74 - Digital PID Controller - Hardware Implementation and Experimental Results
- Lecture 75 - Top Down Design Methodology in Mixed-Signal Current Mode Control
- Lecture 76 - Top Down Design Method and Verilog HDL Programming of Mixed-Signal CMC
- Lecture 77 - Verilog HDL based Digital PI Control Implementation of Mixed-Signal CMC
- Lecture 78 - Hardware Implementation of Mixed-Signal CMC and Experimental Results
- Lecture 79 - Voltage based Digital Pulse Skip Modulation and Top Down Design Method
- Lecture 80 - Implementing Digital Pulse Skip Modulation and Experimental Results
- Lecture 81 - STM32 Overview and STM32G4x ecosystem
- Lecture 82 - Getting started with STM32CubeMX - Part I
- Lecture 83 - Getting started with STM32CubeMX - Part II
- Lecture 84 - Practical implementation of LLC converters - Part I
- Lecture 85 - Practical implementation of LLC converters - Part II
- Lecture 86 - Texas Instruments C2000 Real-time Microcontroller Devices
- Lecture 87 - Getting Started with C2000 - Software and Hardware Development
- Lecture 88 - Texas Instruments C2000 key peripheral differentiations
- Lecture 89 - Texas Instruments TIDM-02008 Reference Design Overview
- Lecture 90 - Texas Instruments TIDM-02008 Reference Design Software Overview
- Lecture 91 - Steps for FPGA Implementation of Digital Voltage Mode Control
- Lecture 92 - Steps for FPGA Implementation of Mixed-Signal Current Mode Control
- Lecture 93 - Instability in Digital CMC and Ramp Compensation with Experimental Results
- Lecture 94 - Benefits of Constant Off-Time and On-Time Digital CMC Techniques
- Lecture 95 - Top Down Design Methodology of Constant On/Off-Time Control
- Lecture 96 - Verilog HDL Implementation of Voltage based Constant On-Time Control
- Lecture 97 - FPGA Implementation of Constant On/Off-Time Mixed-Signal CMC
- Lecture 98 - Stability Comparison of Fixed and Variable Freq. Digital CMC with Experimental Results
- Lecture 99 - Assessment of Digital Control Techniques for Light Load DC-DC Converters
- Lecture 100 - Adaptive On-Time Digital Control in DCM with Verilog HDL Implementation
- Lecture 101 - MATLAB Simulation of a Practical Digital VMC Buck Converter in CCM
- Lecture 102 - Data Acquisition and Steps for Validating Simulation and Experimental Results
- Lecture 103 - Loop Shaping and Design of Digital Voltage Mode Control in a Buck Converter
- Lecture 104 - Digital VMC Design for Shaping Output Impedance in a Buck Converter
- Lecture 105 - Hardware Case Studies and Transient Performance in Digital VMC Buck Converter
- Lecture 106 - Design and Simulation Case Studies in a Mixed-Signal CMC Buck Converter
- Lecture 107 - Hardware Case Studies and Transient Performance in a Digital CMC Buck Converter

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- Lecture 108 - Analysis of Output Impedance in Digital CMC with Load Current Feedforward
- Lecture 109 - Load Current Feedforward in Digital CMC Buck Converter: Experimental Results
- Lecture 110 - Need for Multi-Mode Digital Control and Design Requirements in SMPCs
- Lecture 111 - Implementing Bi-frequency Spread Spectrum in Digital VMC using Verilog HDL
- Lecture 112 - Performance of Bi-frequency Spread Spectrum DPWM and Experimental Results
- Lecture 113 - Top Down Design Methodology of PWM/PSM Multi-Mode Digital Control
- Lecture 114 - Verilog HDL based FPGA Prototyping of PWM/PSM Multi-Mode Digital Control
- Lecture 115 - FPGA Prototyping of Peak Current based PWM/PFM Multi-Mode Digital Control - I
- Lecture 116 - FPGA Prototyping of Peak Current based PWM/PFM Multi-Mode Digital Control - II
- Lecture 117 - Industry-Driven Architectures for Digital Control IC in High Frequency SMPC
- Lecture 118 - Industry-Driven Architectures for Digital Control System Solutions in SMPCs
- Lecture 119 - Exploration of Architectures, Modeling, Design, and Control - Course Summary
- Lecture 120 - Key Takeaways and Course Usefulness for Skilled Manpower Development

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

NPTEL Video Course - Electrical Engineering - NOC:VLSI Interconnects

Subject Co-ordinator - Prof. Sarang Pendharker

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to VLSI interconnects
- Lecture 2 - The distributed RC interconnect model
- Lecture 3 - The Elmore delay
- Lecture 4 - Elmore delay in interconnects
- Lecture 5 - Elmore delay in branched RC interconnects
- Lecture 6 - Equivalent circuit for RC interconnects
- Lecture 7 - Scaling effects in interconnects
- Lecture 8 - Delay mitigation in RC interconnects
- Lecture 9 - RC interconnect simulation
- Lecture 10 - Inductive effects in interconnects
- Lecture 11 - Distributed RLC interconnect model
- Lecture 12 - Transmission line equations
- Lecture 13 - When to consider the inductive effects?
- Lecture 14 - The transfer function of an RLC interconnect
- Lecture 15 - Time domain response of a lumped RLC circuit
- Lecture 16 - Equivalent Elmore model for RLC interconnects
- Lecture 17 - Two-pole model of RLC interconnects from ABCD parameters
- Lecture 18 - RLC interconnect simulation
- Lecture 19 - Origin of the skin effect
- Lecture 20 - Effective resistance at high frequencies
- Lecture 21 - Equivalent circuit to simulate skin effect
- Lecture 22 - Power dissipation due to interconnects
- Lecture 23 - Optimum interconnect width for minimizing total power dissipation
- Lecture 24 - Heating effects and thermal modeling
- Lecture 25 - Compact thermal modeling with equivalent electrical circuits
- Lecture 26 - Electromigration in interconnects
- Lecture 27 - Mitigation of electromigration
- Lecture 28 - Capacitive coupling in interconnects
- Lecture 29 - Cross-talk and timing jitters in two identical interconnects

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

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- Lecture 30 - Coupling effects and mitigation techniques
- Lecture 31 - Matrix formulation of coupled interconnects
- Lecture 32 - Coupled RLC interconnects
- Lecture 33 - Decoupling of interconnects by diagonalization of matrix
- Lecture 34 - Analysis of coupled interconnects: Examples - 1
- Lecture 35 - Analysis of coupled interconnects: Examples - 2
- Lecture 36 - Simulation of RC coupled interconnects
- Lecture 37 - Extraction of capacitance - Part 1
- Lecture 38 - Extraction of capacitance - Part 2
- Lecture 39 - Extraction of inductance - Part 1
- Lecture 40 - Extraction of inductance - Part 2
- Lecture 41 - Estimation of interconnect parameters from S-parameters

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

NPTEL Video Course - Electrical Engineering - NOC:Semiconductor Device Modeling and Simulation

Subject Co-ordinator - Prof. Vivek Dixit

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction  
Lecture 2 - Introduction (Continued...)  
Lecture 3 - Crystal Concept  
Lecture 4 - Crystal Concept  
Lecture 5 - Crystal Concept  
Lecture 6 - Reciprocal Space  
Lecture 7 - Problem Session - 1  
Lecture 8 - Doping In Semiconductors  
Lecture 9 - Bandstructure  
Lecture 10 - Effective Mass  
Lecture 11 - Density of States  
Lecture 12 - Mobility  
Lecture 13 - Problem Session - 2  
Lecture 14 - Semiconductor statistics  
Lecture 15 - Semiconductor statistics (Continued...)  
Lecture 16 - P-N Junction  
Lecture 17 - P-N Junction (Continued...)  
Lecture 18 - P-N Junction (Continued...)  
Lecture 19 - Problem Session - 3  
Lecture 20 - BJT  
Lecture 21 - Bipolar Junction Transistor  
Lecture 22 - Bipolar Junction Transistor (Continued...)  
Lecture 23 - Bipolar Junction Transistor (Continued...)  
Lecture 24 - Problem Session - 4  
Lecture 25 - Metal- Semiconductor Interface  
Lecture 26 - Schottky junction  
Lecture 27 - Field Effect Transistor  
Lecture 28 - MOS Capacitor  
Lecture 29 - MOS-CV

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- Lecture 30 - REAL MOS (Continued...)
- Lecture 31 - MOSFET
- Lecture 32 - MOSFET (Continued...)
- Lecture 33 - Problem Session - 5
- Lecture 34 - Semiclassical Transport
- Lecture 35 - Semiclassical Transport (Continued...)
- Lecture 36 - Semiclassical Transport (Continued...)
- Lecture 37 - Semiclassical Transport (Continued...)
- Lecture 38 - Semiclassical Transport (Continued...)
- Lecture 39 - Problem Session - 6
- Lecture 40 - Drift-diffusion model
- Lecture 41 - Drift-diffusion model (Continued...)
- Lecture 42 - Drift-diffusion model (Continued...)
- Lecture 43 - Drift-diffusion model (Continued...)
- Lecture 44 - Generation-Recombination
- Lecture 45 - Generation-Recombination (Continued...)
- Lecture 46 - Solving DD Equations (Continued...)
- Lecture 47 - Solving DD Equations (Continued...)
- Lecture 48 - Problem Session - 7
- Lecture 49 - Hydrodynamic Model
- Lecture 50 - Hydrodynamic Model (Continued...)
- Lecture 51 - Hydrodynamic Model (Continued...)
- Lecture 52 - Monte Carlo simulations
- Lecture 53 - Problem Session - 8
- Lecture 54 - Quantum Mechanics
- Lecture 55 - Solving Schrodinger Equation
- Lecture 56 - Quantum Correction Models
- Lecture 57 - Quantum Transport
- Lecture 58 - Transfer Matrix Approach
- Lecture 59 - TCAD Tools
- Lecture 60 - ATLAS SILVACO
- Lecture 61 - Simulating Junctions
- Lecture 62 - Models and Simulation Concepts
- Lecture 63 - Mixed-mode Simulation

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

NPTEL Video Course - Electrical Engineering - NOC:RF and Microwave Networks

Subject Co-ordinator - Prof. Bratin Ghosh

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - The network concept  
Lecture 2 - One-port network  
Lecture 3 - One-port network, Two-port network  
Lecture 4 - Two-port network, Signal flow graph  
Lecture 5 - Tutorial - 1  
Lecture 6 - General analysis of cylindrical waveguides  
Lecture 7 - TE to z mode analysis of cylindrical waveguides  
Lecture 8 - TE to z mode analysis of cylindrical waveguides (Continued...), TM to z mode analysis  
Lecture 9 - Normalization of mode vectors, Characteristics of eigen values and eigen functions  
Lecture 10 - Wave impedance for TE and TM to z modes, Transmission line analogy for mode voltage  
Lecture 11 - Transmission line equivalence for TE and TM modes, Power calculation using  
Lecture 12 - Tutorial - 2  
Lecture 13 - Modal expansion in cylindrical waveguides, Concept of mode orthogonality  
Lecture 14 - Concept of mode orthogonality (continued), Determination of arbitrary mode  
Lecture 15 - Power orthogonality in cylindrical waveguides  
Lecture 16 - Tutorial - 3  
Lecture 17 - Modal expansion of fields in rectangular waveguides  
Lecture 18 - Modal expansion of fields in rectangular waveguides (Continued), Capacitive rectangular  
Lecture 19 - Capacitive rectangular waveguide junction (Continued...)  
Lecture 20 - Inductive rectangular waveguide junction (Continued...)  
Lecture 21 - Inductive rectangular waveguide junction (Continued...), Construction of solutions  
Lecture 22 - Cylindrical waveguide junctions (Continued...)  
Lecture 23 - Cylindrical waveguide junctions (Continued...)  
Lecture 24 - Cylindrical waveguide junctions (Continued...), Example of capacitive rectangular  
Lecture 25 - Cylindrical waveguide junctions (Continued...), Example of capacitive rectangular  
Lecture 26 - Example of inductive waveguide junction (Continued...), Alternative equivalent circuit  
Lecture 27 - Tutorial - 4  
Lecture 28 - Obstacles in waveguides  
Lecture 29 - Obstacles in waveguides (Continued...)

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

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- Lecture 30 - Obstacles in waveguides (Continued...)
- Lecture 31 - Small obstacles in waveguides
- Lecture 32 - Small obstacles in waveguides (Continued...)
- Lecture 33 - Small obstacles in waveguides, Reciprocity
- Lecture 34 - Reciprocity
- Lecture 35 - Reciprocity (Continued...)
- Lecture 36 - Tutorial - 5
- Lecture 37 - Posts in rectangular waveguide
- Lecture 38 - Posts in rectangular waveguide (Continued...)
- Lecture 39 - Posts in rectangular waveguide (Continued...)
- Lecture 40 - Posts in rectangular waveguide (Continued...)
- Lecture 41 - Diaphragms in waveguide
- Lecture 42 - Diaphragms in waveguide (Continued...)
- Lecture 43 - Diaphragms in waveguide (Continued...)
- Lecture 44 - Diaphragms in waveguide (Continued...)
- Lecture 45 - Tutorial - 6
- Lecture 46 - Currents in Waveguides
- Lecture 47 - Currents in Waveguides (Continued...)
- Lecture 48 - Coaxial to waveguide junction with matched termination
- Lecture 49 - Coaxial to waveguide feeds with arbitrary termination
- Lecture 50 - Coaxial to waveguide feeds with arbitrary termination (Continued...)
- Lecture 51 - Coaxial to waveguide feeds with arbitrary termination (Continued...)
- Lecture 52 - Coaxial to waveguide feeds with arbitrary termination (Continued...)
- Lecture 53 - Tutorial - 7
- Lecture 54 - Apertures in the ground plane
- Lecture 55 - Apertures in the ground plane (Continued...)
- Lecture 56 - Apertures in the ground plane (Continued...)
- Lecture 57 - Apertures in the ground plane (Continued...), Plane current sheets
- Lecture 58 - Plane current sheets (Continued...)
- Lecture 59 - Tutorial - 8
- Lecture 60 - Excitation of Apertures
- Lecture 61 - Tutorial - 9
- Lecture 62 - Modal expansion in cavities
- Lecture 63 - Probes in cavities
- Lecture 64 - Tutorial - 10
- Lecture 65 - Aperture coupling to cavities
- Lecture 66 - Aperture coupling to cavities (Continued...)
- Lecture 67 - Wave interaction with cylindrical structures
- Lecture 68 - Wave interaction with cylindrical structures (Continued...)

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

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- Lecture 69 - Wave interaction with cylindrical structures (Continued...)
- Lecture 70 - Wave interaction with cylindrical structures (Continued...)
- Lecture 71 - Wave interaction with cylindrical structures (Continued...)
- Lecture 72 - Wave interaction with cylindrical structures (Continued...)
- Lecture 73 - Wave interaction with cylindrical structures (Continued...)
- Lecture 74 - Wave interaction with cylindrical structures (Continued...)
- Lecture 75 - Tutorial - 12



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

NPTEL Video Course - Electrical Engineering - NOC:Introduction to Adaptive Signal Processing

Subject Co-ordinator - Prof. Mrityunjay Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction to Adaptive Filters  
Lecture 2 - Probability and Random Variables  
Lecture 3 - General Set of Random Variables  
Lecture 4 - Statistical Impedance, Covariance Matrices  
Lecture 5 - Multivariate Gaussian Density  
Lecture 6 - Complex Random Variables  
Lecture 7 - Introduction to Hermitian Matrices  
Lecture 8 - Eigenvalues and eigenvectors of Hermitian Matrices  
Lecture 9 - Spectral Decomposition of Hermitian Matrices  
Lecture 10 - Positive Definite and Semidefinite Matrices  
Lecture 11 - Introduction to Discrete Time Random Processes  
Lecture 12 - Power Spectral Density (PSD)  
Lecture 13 - PSD and Linear Time Invariant Systems  
Lecture 14 - Optimal FIR Filter  
Lecture 15 - Optimal FIR Filter (Continued...)  
Lecture 16 - LMS Algorithm  
Lecture 17 - Convergence Proof of LMS Algorithm  
Lecture 18 - Convergence Proof of LMS Algorithm (Continued...)  
Lecture 19 - Application of Adaptive Filter  
Lecture 20 - Application of Adaptive Filter (Continued...)  
Lecture 21 - Application of Adaptive Filter (Continued...)  
Lecture 22 - Applications of Adaptive Filter  
Lecture 23 - Applications of Adaptive Filter  
Lecture 24 - Second Order Analysis of LMS Algorithm  
Lecture 25 - Second Order Analysis of LMS Algorithm (Continued...)  
Lecture 26 - Second Order Analysis of LMS Algorithm (Continued...)  
Lecture 27 - Second Order Analysis of LMS Algorithm (Continued...)  
Lecture 28 - NLMS Algorithm  
Lecture 29 - NLMS Algorithm

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

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- Lecture 30 - Affine Projection Algorithm (APA)
- Lecture 31 - Affine Projection Algorithm (APA)
- Lecture 32 - Introduction to RLS Algorithm
- Lecture 33 - Introduction to RLS Algorithm (Continued...)
- Lecture 34 - Introduction to RLS Algorithm (Continued...)
- Lecture 35 - Formulation of the RLS Algorithm
- Lecture 36 - Introduction to RLS Algorithm
- Lecture 37 - Introduction to RLS Algorithm
- Lecture 38 - Formulation of the RLS Algorithm
- Lecture 39 - Derivation of the RLS transversal adaptive filter
- Lecture 40 - Derivation of the RLS transversal adaptive filter
- Lecture 41 - Derivation of the RLS transversal adaptive filter

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

NPTEL Video Course - Electrical Engineering - NOC:Nanobiophotonics: Touching Our Daily Life

Subject Co-ordinator - Dr. Basudev Lahiri

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - What is Nano Bio Photonics?

Lecture 2 - Why is Nano Bio Photonics?

Lecture 3 - Why do this?

Lecture 4 - Why Photonics?

Lecture 5 - Why Biology?

Lecture 6 - Nature of Light

Lecture 7 - Light-Matter Interactions

Lecture 8 - Introduction to Fluorescence

Lecture 9 - The Cell

Lecture 10 - The Central Dogma

Lecture 11 - Facts of Matter

Lecture 12 - Introduction to Nanotechnology

Lecture 13 - Nanotechnology: The art of small

Lecture 14 - Synthesis of Nanomaterials : Top-Down Approach

Lecture 15 - Applications of Nanomaterials in Photonics

Lecture 16 - Interaction of Light with Cells

Lecture 17 - Light-matter interactions in molecules (Basic of Spectroscopy)

Lecture 18 - Imaging for Biological Matters

Lecture 19 - Fluorophores and Fluorescence Microscopy Techniques

Lecture 20 - Primary Examples

Lecture 21 - Basics of Flow Cytometry - Part 1

Lecture 22 - Basics of Flow Cytometry - Part 2

Lecture 23 - Data manipulation and presentation

Lecture 24 - Application of Flow cytometry in Biology

Lecture 25 - Raman Assisted Flow cytometry

Lecture 26 - Genetic Code

Lecture 27 - Biosensing Background

Lecture 28 - Basics of Microarray Technology

Lecture 29 - DNA Microarray Technology

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

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- Lecture 30 - Protein Microarray Technology
- Lecture 31 - Laser Principles and Operation
- Lecture 32 - Nonlinear Optical Processes
- Lecture 33 - In Vivo Photoexcitation
- Lecture 34 - Light/Laser Activated Therapy
- Lecture 35 - Laser Tissue Contouring
- Lecture 36 - Metamaterials
- Lecture 37 - Metamaterials as Biosensors
- Lecture 38 - Biosensing with Optical Nano-Antennas
- Lecture 39 - Nanoscale Chemical Imaging
- Lecture 40 - Optical Tweezers
- Lecture 41 - Introduction to Optogenetics
- Lecture 42 - Controlling the Brain with Light
- Lecture 43 - The Nervous System
- Lecture 44 - The Neural Circuits
- Lecture 45 - Optical Neuroimaging and Tomography
- Lecture 46 - Functional Near-Infrared Spectroscopy (fNIRS) of the Brain
- Lecture 47 - Neuro imaging with Light-Sheet Microscopy
- Lecture 48 - Brain imaging with Two Photon Microscopy
- Lecture 49 - Brain imaging with functional optoacoustic Imaging
- Lecture 50 - Tomographic technique for Brain imaging
- Lecture 51 - Optogenetic Modulation of Neural Circuits
- Lecture 52 - Nanoparticles for Optical Modulation of Neuronal Behavior
- Lecture 53 - Optical Stimulation of Neural Circuits in Freely Moving Animals
- Lecture 54 - Higher Harmonic Generation Imaging for Neuropathology
- Lecture 55 - Multi-Photon Nanosurgery
- Lecture 56 - Bioinspired materials for photonics
- Lecture 57 - Bioderived Materials
- Lecture 58 - Bioinspired Materials
- Lecture 59 - Biotemplates
- Lecture 60 - Summary and Revisiting Few Topics

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

NPTEL Video Course - Electrical Engineering - NOC:EMI-EMC and Signal Integrity: Principles, Techniques and Ap

Subject Co-ordinator - Prof. Amitabha Bhattacharya

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Electromagnetic Environment
- Lecture 2 - Introduction to Electromagnetic Compatibility
- Lecture 3 - EMC Standards
- Lecture 4 - EMC Units and Signal Spectrum
- Lecture 5 - Single Sided Spectrum
- Lecture 6 - Response of Linear Systems to Periodic Input Signals
- Lecture 7 - Important Computational Techniques
- Lecture 8 - Fourier Coefficient for Piecewise Linear Periodic Waveforms
- Lecture 9 - Fourier Coefficient for Piecewise Linear Periodic Waveforms (Continued...)
- Lecture 10 - Trapezoidal Clock
- Lecture 11 - Spectral Bounds for Trapezoidal Clock
- Lecture 12 - Spectral estimation of trapezoidal clock
- Lecture 13 - Effect of Rise/Fall Time on Spectral Bound of a Clock
- Lecture 14 - Effect of Ringing on Spectral Bounds
- Lecture 15 - Spectral Bounds for Linear System Output
- Lecture 16 - Resolution Bandwidth of a Spectrum Analyser
- Lecture 17 - Detector of Spectrum Analyser
- Lecture 18 - Radiated Emission Model Subproblem - I
- Lecture 19 - Farfield Characteristics of Current Element: Some Discussion
- Lecture 20 - Farfield of Dipole Antena
- Lecture 21 - Farfield models of wire antenna and current models
- Lecture 22 - Differential mode current emission model
- Lecture 23 - Differential mode current emission model (Continued...)
- Lecture 24 - Common Mode Current Emission Model
- Lecture 25 - Current Measurement
- Lecture 26 - Radiated Susceptibility Models
- Lecture 27 - Determination of Per Unit Length Inductance (Continued...)
- Lecture 28 - Per Unit Length Parameters of Various Two Wire Lines
- Lecture 29 - Radiated Susceptibility Model

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

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- Lecture 30 - Radiated Susceptibility Model (Continued...)
- Lecture 31 - Radiated Susceptibility Model (Continued...)
- Lecture 32 - Crosstalk
- Lecture 33 - Development of Multi Conductor Transmission Line Equation
- Lecture 34 - Per Unit Length Parameter of a Three Conductor System
- Lecture 35 - Parameters of Three Conductor Systems (Continued...)
- Lecture 36 - Parameters of Three Conductor Systems (Continued...)
- Lecture 37 - Development of crosstalk model infrequency domain
- Lecture 38 - Determination of Terminal Currents of a three conductor system
- Lecture 39 - Derivation of Chain Parameter Matrix
- Lecture 40 - Determination of Crosstalk in a Lossless Line Immersed in Homogeneous Medium
- Lecture 41 - Determination of Crosstalk (Continued...)
- Lecture 42 - Determination of Crosstalk (Continued...)
- Lecture 43 - Determination of Crosstalk (Continued...)
- Lecture 44 - Inductive and Capacitive coupling
- Lecture 45 - Time Domain Crosstalk
- Lecture 46 - Time Domain Crosstalk (Continued...)
- Lecture 47 - Inclusion of Losses in Transient Crosstalk
- Lecture 48 - Conducted emission and susceptibility
- Lecture 49 - Shielding
- Lecture 50 - Shielding Effectiveness for Farfield Source
- Lecture 51 - Shielding Effectiveness Due to Farfield Source (Continued...)
- Lecture 52 - SE Due to Farfield Sources (Continued...) and Free Space Impedance Ar Nearfield
- Lecture 53 - Shielding for Nearfield Source
- Lecture 54 - EMC System Aspect for Shielding
- Lecture 55 - Grounding
- Lecture 56 - Grounding (Continued...)
- Lecture 57 - Bonds and Joints
- Lecture 58 - EMC Case Studies
- Lecture 59 - Electrostatic Discharge (ESD)

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

NPTEL Video Course - Electrical Engineering - NOC:Embedded Sensing, Actuation and Interfacing Systems

Subject Co-ordinator - Prof. Banibrata Mukherjee

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Real-life Examples Illustration
- Lecture 3 - Sensor Structure and Characteristics
- Lecture 4 - Sensor and Actuator Characteristics and Numerical Problem
- Lecture 5 - Temperature Sensors and its Signal Conditioning Circuits
- Lecture 6 - Motion Sensors and its Interfacing Aspects
- Lecture 7 - Gyroscope and Strain Gauge
- Lecture 8 - Strain Gauge and Optical Sensor
- Lecture 9 - Optical Encoder, Gas Sensor and Chemical Sensor
- Lecture 10 - Magnetic Sensor and Actuator
- Lecture 11 - Electrical Actuator
- Lecture 12 - Electrical Actuator: Stepper Motor and Heater
- Lecture 13 - Smart Material Actuator
- Lecture 14 - Metamaterial and Other Actuators
- Lecture 15 - Op-amp based circuits and amplifier
- Lecture 16 - Various Op-amp Configurations
- Lecture 17 - Instrumentation Amplifier and Filter
- Lecture 18 - Passive and Active Filters
- Lecture 19 - Universal Filter and Data Converter
- Lecture 20 - ADC and DAC
- Lecture 21 - Sampling Issue and Communication Protocol
- Lecture 22 - Bridge Circuits and their Linearity Improvement
- Lecture 23 - Linearization and error reduction schemes
- Lecture 24 - Principle of Direct Interfacing Scheme
- Lecture 25 - Various Aspects of Direct Interfacing
- Lecture 26 - Direct Interfacing for Differential and Bridge Type Resistive Sensor
- Lecture 27 - Measurement Uncertainties and Interface of Sensor Array
- Lecture 28 - Various Configurations of Capacitive Sensors
- Lecture 29 - Analog Interface Circuit and Direct Interfacing Scheme

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

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- Lecture 30 - Direct Interfacing Scheme for Differential Capacitive Sensor
- Lecture 31 - Lossy Capacitive Sensor and its Interfacing Aspect
- Lecture 32 - Advanced Interfacing Circuits for Lossy Capacitive Sensor
- Lecture 33 - Autobalance Active Bridge Interfacing Circuit
- Lecture 34 - Background of Miniaturization
- Lecture 35 - Micromachining Technology for MEMS Devices
- Lecture 36 - Bulk and Surface Micromachining and Fabrication Steps
- Lecture 37 - MEMS Fabrication Process - Part 1
- Lecture 38 - MEMS Fabrication Process - Part 2
- Lecture 39 - MEMS Fabrication Process - Part 3
- Lecture 40 - MEMS Fabrication Process - Part 4
- Lecture 41 - MEMS-IC Integration Aspects and Miniaturized Sensor
- Lecture 42 - MEMS Pressure Sensor and Interfacing Electronics
- Lecture 43 - MEMS Accelerometer
- Lecture 44 - MEMS Capacitive Accelerometer and Interfacing Electronics
- Lecture 45 - Interfacing Electronics Details for MEMS Accelerometer
- Lecture 46 - MEMS Gyroscope and Flow sensor
- Lecture 47 - MEMS Actuator
- Lecture 48 - MEMS Electrostatic Actuator Analysis
- Lecture 49 - Background of Renewable Energy Harvesting
- Lecture 50 - Various Transduction Mechanisms for Energy Harvester
- Lecture 51 - Vibration Energy Harvester and its Interfacing Aspects
- Lecture 52 - Interfacing Power Management Circuit for Vibration Energy Harvester
- Lecture 53 - Demonstration of Energy Harvester Set-up and Self-powered Embedded System
- Lecture 54 - Background of Embedded Sensors and Actuators in Automotives
- Lecture 55 - Applications in Safety System of Automotive
- Lecture 56 - Applications in Safety System and Engine Control System
- Lecture 57 - Application in Cardiovascular Measurements
- Lecture 58 - Applications in Remote Healthcare and Smart Medical Devices
- Lecture 59 - Electronic Nose and its Applications in Disease Detection
- Lecture 60 - Virtual Sensing, Research Scopes, Summary and Key Takeaways of the Course



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

NPTEL Video Course - Electrical Engineering - NOC:A Basic Course on Electric and Magnetic Circuits

Subject Co-ordinator - Prof. Ashok Kumar Pradhan

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Electric systems
- Lecture 2 - Resistive circuit connections
- Lecture 3 - Nodal analysis
- Lecture 4 - Mesh Analysis / Loop Analysis
- Lecture 5 - Mixed sources - Mesh and Nodal analysis
- Lecture 6 - Superposition Theorem
- Lecture 7 - Thevenin's Theorem and its applications
- Lecture 8 - Norton's theorem and Maximum power transfer theorem
- Lecture 9 - Review problems on DC circuits
- Lecture 10 - Average and RMS values Phasor representation of sinusoids Reactance
- Lecture 11 - Series AC circuits, R-L, R-C, R-L-C
- Lecture 12 - KVL and KCL Series and parallel combination of impedance Star - delta transformations
- Lecture 13 - Power Curves for AC circuits
- Lecture 14 - Real and Reactive Power
- Lecture 15 - Loop current method, nodal analysis and theorems
- Lecture 16 - Theorem-examples, maximum power transfer theorem
- Lecture 17 - Resonance
- Lecture 18 - Power Factor Improvement
- Lecture 19 - Review problems on AC circuits
- Lecture 20 - Capacitor - properties series - parallel combinations
- Lecture 21 - Inductor - properties series - parallel combinations
- Lecture 22 - Source free RC and RL circuits
- Lecture 23 - Step response of RC and RL circuits
- Lecture 24 - Review Problems on RL and RC transients
- Lecture 25 - Basics on three phase systems
- Lecture 26 - Line and phase currents and voltages in star connected systems
- Lecture 27 - Line and phase voltages and currents in delta connected systems
- Lecture 28 - Three phase power
- Lecture 29 - Three phase power and Power factor

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

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- Lecture 30 - Measurement of 3 - phase power
- Lecture 31 - Magnetic flux, flux density, magnetic field strength
- Lecture 32 - Reluctance Equivalent magnetic circuit Solving Magnetic Circuits
- Lecture 33 - Solving Magnetic Circuits
- Lecture 34 - Hysteresis loop Hysteresis and Eddy Current loss
- Lecture 35 - Self and Mutual inductances Dot Convention
- Lecture 36 - Solving Magnetic Coupled Circuits
- Lecture 37 - Magnetic Circuit applications
- Lecture 38 - Transformer Basics, The emf equation
- Lecture 39 - Ideal transformer, Impedance referred to primary
- Lecture 40 - Practical transformer, Transformer equivalent circuit diagram
- Lecture 41 - Voltage Drop and Voltage Regulation Calculation
- Lecture 42 - Efficiency of Transformer
- Lecture 43 - Transformer Tests, Transformer Applications

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

NPTEL Video Course - Electrical Engineering - Modelling and Analysis of Electric Machines

Subject Co-ordinator - Dr. Krishna Vasudevan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction

Lecture 2 - Magnetic Fields

Lecture 3 - Magnetic Circuit

Lecture 4 - Singly Excited Linear Motion System

Lecture 5 - Linear and Cylindrical Motion Systems

Lecture 6 - Systems with Multiple Excitations

Lecture 7 - Non-linear Magnetic Systems

Lecture 8 - Inductances in Constant Air gap Machines

Lecture 9 - Inductance in Salient Pole Machine - I

Lecture 10 - Inductance in Salient Pole Machine - II

Lecture 11 - Inductance in Salient Pole Machine - III

Lecture 12 - Inductance in Salient Pole Machine - IV

Lecture 13 - Inductance in Salient Pole Machine - V

Lecture 14 - Inductances of Distributed Winding - I

Lecture 15 - Inductances of Distributed Winding - II

Lecture 16 - Inductances of Distributed Winding - III

Lecture 17 - Dynamic Equations of Induction Machines

Lecture 18 - Dynamic Equations of Salient Pole Synchronous Machine

Lecture 19 - Three-to-Two Phase Transformation

Lecture 20 - Induction Machine in Two-Phase Reference Frame

Lecture 21 - The Pseudo-Stationary Reference Frame

Lecture 22 - Induction Machine in Pseudo-Stationary Reference Frame

Lecture 23 - The Primitive Machine Equations

Lecture 24 - Dynamic Equations of DC Machines

Lecture 25 - Small Signal Model of DC Machine

Lecture 26 - Small Signal Behaviour of DC Machine

Lecture 27 - The Arbitrary Reference Frame

Lecture 28 - Induction Machine Equations in Arbitrary, Synchronous Reference Frames and Small Signal Modelling

Lecture 29 - Introduction to Field Oriented Control of Induction Machines

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

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- Lecture 30 - Space Vector Formulation of Induction Machine Equations
- Lecture 31 - Modelling of Salient Pole Synchronous Machines - I
- Lecture 32 - Modelling of Salient Pole Synchronous Machines - II
- Lecture 33 - Modelling of Salient Pole Synchronous Machines - III
- Lecture 34 - Steady State Models - Induction Machine
- Lecture 35 - Steady State Models - Salient Pole Synchronous Machine
- Lecture 36 - Solution of Dynamic Equations of Induction Machine - I
- Lecture 37 - Solution of Dynamic Equations of Induction Machine - II
- Lecture 38 - Reactances of Salient Pole Synchronous Machines - I
- Lecture 39 - Reactances of Salient Pole Synchronous Machines - II
- Lecture 40 - Reactances of Salient Pole Synchronous Machines - III
- Lecture 41 - Sudden Short Circuit of Three Phase Alternator - Analytical Solution
- Lecture 42 - Sudden Short Circuit of Three Phase Alternator - Numerical Simulation
- Lecture 43 - Course Recapitulation and Assignments

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

NPTEL Video Course - Electrical Engineering - Analog ICs

Subject Co-ordinator - Prof. K. Radhakrishna Rao

Co-ordinating Institute - IIT - Madras | Texas Instruments - India

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

- Lecture 1 - Basic Building Blocks In Analog ICs
- Lecture 2 - Current Mirrors
- Lecture 3 - Translinear Networks
- Lecture 4 - Differential Amplifier
- Lecture 5 - Differential Amplifier Characteristics
- Lecture 6 - Video Amplifier and RF/IF Amplifiers
- Lecture 7 - Cascade Amplifier
- Lecture 8 - IC Negative Feedback Wide Band Amplifiers
- Lecture 9 - IC Negative Feedback Amplifiers
- Lecture 10 - Voltage Sources And References
- Lecture 11 - IC Voltage Regulator
- Lecture 12 - Characteristics and Parameters Of Voltage
- Lecture 13 - Protection Circuitry For Voltage Regulator
- Lecture 14 - Switched Mode Regulator And Operational
- Lecture 15 - IC Operational Voltage Amplifier
- Lecture 16 - General Purpose Operational Amplifier-747
- Lecture 17 - Transconductance Operational Amplifier
- Lecture 18 - Audio Power Amplifier and Norton's Amplifier
- Lecture 19 - Analog Multipliers
- Lecture 20 - Analog Multipliers
- Lecture 21 - Voltage Controlled Oscillator
- Lecture 22 - Voltage Controlled Oscillator
- Lecture 23 - Self Tuned Filter
- Lecture 24 - Phase Locked Loop<sup>24</sup> Phase Locked Loop
- Lecture 25 - Phase Locked Loop
- Lecture 26 - Phase Locked Loop
- Lecture 27 - Phase Locked Loop
- Lecture 28 - Current Mode ICs

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

NPTEL Video Course - Electrical Engineering - Digital Integrated Circuits

Subject Co-ordinator - Prof. Amitava Dasgupta

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Semiconductors
- Lecture 2 - Modelling of PN Junction Diodes
- Lecture 3 - Modelling of BJTs
- Lecture 4 - Diode and BJT Model Parameter Extraction
- Lecture 5 - BJT Inverters DC and Switching Characteristics
- Lecture 6 - Schottky Transistor
- Lecture 7 - Specifications of Logic Circuits
- Lecture 8 - Qualitative discussion on TTL Circuits
- Lecture 9 - Standard TTL Circuits
- Lecture 10 - Schottky (74s..) and Low power Schottky (74ls)
- Lecture 11 - Advanced TTL Circuits
- Lecture 12 - I<sup>2</sup> L Technology
- Lecture 13 - Edge triggered D-F/F
- Lecture 14 - I<sup>2</sup> L - Condition for Proper Operation
- Lecture 15 - I<sup>2</sup> L - Propagation delay Self aligned
- Lecture 16 - Schottky Transistor Logic
- Lecture 17 - Stacked I<sup>2</sup> L
- Lecture 18 - ECL Basic Operation
- Lecture 19 - Quantitative analysis of ECL 10k Series gates
- Lecture 20 - ECL 100k series; Stacked ECL gates; D-F/F
- Lecture 21 - Emitter Function Logic; Low Power ECL
- Lecture 22 - Polyemitter Bipolar Transistor In ECL; Propagation
- Lecture 23 - Heterojunction Bipolar Transistor Based ECL; ECL
- Lecture 24 - nMOS Logic Circuits
- Lecture 25 - nMOS Logic Circuits(contd); CMOS
- Lecture 26 - CMOS Inverter
- Lecture 27 - CMOS NAND, NOR and Other Gates
- Lecture 28 - Dynamic CMOS ; Transmission Gates; Realization Of MUX, decoder, D-F/F
- Lecture 29 - BiCMOS Gates

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

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- Lecture 30 - BiCMOS Driver;BiCMOS 32-bit Adder
- Lecture 31 - Digital Integrated Circuits
- Lecture 32 - Digital Integrated Circuits
- Lecture 33 - CMOS SRAM
- Lecture 34 - BiCMOS SRAM
- Lecture 35 - DRAM-CMOS and BiCMOS
- Lecture 36 - ROM-EPROM,EEPROM and Flash EPROM
- Lecture 37 - GaAs MESFET Characteristics and Equivalent Circuits
- Lecture 38 - Direct Coupled FET Logic; Superbuffer FET Logic
- Lecture 39 - Buffered FET Logic; Schottky Diode FET Logic
- Lecture 40 - Transmission Line Effects

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

NPTEL Video Course - Electrical Engineering - Electromagnetic Fields

Subject Co-ordinator - Prof. Harishankar Ramachandran

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction To Vector
- Lecture 2 - Introduction To Vector (Continued...)
- Lecture 3 - Coulomb's Law
- Lecture 4 - Electric Field
- Lecture 5 - Electro Static Potential
- Lecture 6 - The Gradient
- Lecture 7 - Gauss's Law
- Lecture 8 - Poisson's Equation
- Lecture 9 - Energy In The Field
- Lecture 10 - Sample Problems In Electrostatics
- Lecture 11 - Fields In Materials
- Lecture 12 - Fields In Material Bodies
- Lecture 13 - Displacement Vectors
- Lecture 14 - Capacitors
- Lecture 15 - Method Of Images
- Lecture 16 - Poisson's Equation 2 Dimensions
- Lecture 17 - Field Near Sharp Edges And Points
- Lecture 18 - Magnetic Field 1
- Lecture 19 - Magnetic Field 2
- Lecture 20 - Stokes Theorems
- Lecture 21 - The curl
- Lecture 22 - Field due to current loop
- Lecture 23 - Ampere's law
- Lecture 24 - Examples of Ampere's law
- Lecture 25 - Inductance
- Lecture 26 - Mutual Inductance
- Lecture 27 - Faraday's law
- Lecture 28 - Magnetic Energy
- Lecture 29 - Magnetic Energy (Continued...)

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

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- Lecture 30 - Magnetic Energy (Continued...)
- Lecture 31 - Generalised Ampere's Law
- Lecture 32 - The Wave Equation
- Lecture 33 - The Wave Equation
- Lecture 34 - Poynting Theorem
- Lecture 35 - Skin Effect
- Lecture 36 - Skin Effect (Continued...)
- Lecture 37 - Radiation And Circuits
- Lecture 38 - Phasor Form Of Poynting Theorem
- Lecture 39 - Reflection At Dielectric Boundaries
- Lecture 40 - Reflection At Dielectric Boundaries (Continued...)
- Lecture 41 - Transmission Lines
- Lecture 42 - Transmission Lines (Continued...) and Conclusion

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

NPTEL Video Course - Electrical Engineering - Networks and Systems

Subject Co-ordinator - Prof. V.G.K. Murti

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introductory Concepts - 1  
Lecture 2 - Introductory Concepts - 2  
Lecture 3 - Introductory Concepts - 3  
Lecture 4 - Introductory Concepts - 4  
Lecture 5 - Introductory Concepts - 5  
Lecture 6 - Introductory Concepts - 6  
Lecture 7 - Fourier Series - 1  
Lecture 8 - Fourier Series - 2  
Lecture 9 - Fourier Series - 3  
Lecture 10 - Fourier Series - 4  
Lecture 11 - Fourier Series - 5  
Lecture 12 - Fourier Series - 6  
Lecture 13 - Fourier Transforms - 1  
Lecture 14 - Fourier Transforms - 2  
Lecture 15 - Fourier Transforms - 3  
Lecture 16 - Fourier Transforms - 4  
Lecture 17 - Fourier Transforms - 5  
Lecture 18 - Fourier Transforms - 6  
Lecture 19 - Fourier Transforms - 7  
Lecture 20 - Laplace Transforms - 1  
Lecture 21 - Laplace Transforms - 2  
Lecture 22 - Laplace Transforms - 3  
Lecture 23 - Laplace Transforms - 4  
Lecture 24 - Laplace Transforms - 5  
Lecture 25 - Laplace Transforms - 6  
Lecture 26 - Application of Laplace Transforms - 1  
Lecture 27 - Application of Laplace Transforms - 2  
Lecture 28 - Application of Laplace Transforms - 3  
Lecture 29 - Application of Laplace Transforms - 4

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

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Lecture 30	- Network Functions	- 1
Lecture 31	- Network Functions	- 2
Lecture 32	- Network Functions	- 3
Lecture 33	- Network Functions	- 4
Lecture 34	- Network Theorems	- 1
Lecture 35	- Network Theorems	- 2
Lecture 36	- Network Theorems	- 3
Lecture 37	- Network Theorems	- 4
Lecture 38	- Discrete - Time Systems	- 1
Lecture 39	- Discrete - Time Systems	- 2
Lecture 40	- Discrete - Time Systems	- 3
Lecture 41	- Discrete - Time Systems	- 4
Lecture 42	- Discrete - Time Systems	- 5
Lecture 43	- Discrete - Time Systems	- 6
Lecture 44	- Discrete - Time Systems	- 7
Lecture 45	- State-Variable Methods	- 1
Lecture 46	- State-Variable Methods	- 2
Lecture 47	- State Variable Methods	- 3
Lecture 48	- State Variable Methods	- 4
Lecture 49	- State Variable Methods	- 5
Lecture 50	- State Variable Methods	- 6

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

NPTEL Video Course - Electrical Engineering - Probability Foundation for Electrical Engineers

Subject Co-ordinator - Dr. Krishna Jagannathan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction  
Lecture 2 - Cardinality  
Lecture 3 - Countability  
Lecture 4 - Uncountable sets - 1  
Lecture 5 - Uncountable sets - 2  
Lecture 6 - Probability spaces - Introduction  
Lecture 7 - Probability spaces - Algebra  
Lecture 8 - Probability spaces -  $\sigma$ -algebra  
Lecture 9 - Probability spaces - Measurable space  
Lecture 10 - Properties of probability measures  
Lecture 11 - Continuity of probability measure  
Lecture 12 - Discrete probability space - finite and countably infinite sample space  
Lecture 13 - Discrete probability space - Uncountable sample space  
Lecture 14 - Generated  $\sigma$ -algebra, Borel Sets  
Lecture 15 - Borel sets  
Lecture 16 - Uniform probability measure on Borel sets-Lebesgue measure  
Lecture 17 - Carathéodory's extension theorem  
Lecture 18 - Lebesgue measure (Continued...)  
Lecture 19 - Infinite coin toss model  
Lecture 20 - Infinite coin toss model (Continued...)  
Lecture 21 - Conditional probability  
Lecture 22 - Properties of conditional probability  
Lecture 23 - Independence of events  
Lecture 24 - Independence of  $\sigma$ -algebras  
Lecture 25 - Borel-Cantelli Lemma - 1  
Lecture 26 - Borel-Cantelli Lemma - 2  
Lecture 27 - Random Variables  
Lecture 28 - Random Variables (Continued...)  
Lecture 29 - Cumulative Distribution Function

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

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- Lecture 30 - Properties of CDF
- Lecture 31 - Types of Random Variables
- Lecture 32 - Examples of Random Variables
- Lecture 33 - Continuous Random Variables - 1
- Lecture 34 - Examples of Continuous Random Variables - 1
- Lecture 35 - Continuous Random Variables - 2, Examples of Continuous Random Variables - 2
- Lecture 36 - Singular Random Variables
- Lecture 37 - Several Random Variables - 1
- Lecture 38 - Several Random Variables - 2
- Lecture 39 - Independent Random Variables - 1
- Lecture 40 - Independent Random Variables - 2
- Lecture 41 - Conditional PMF, Jointly Continuous Random Variables - 1
- Lecture 42 - Jointly Continuous Random Variables - 2
- Lecture 43 - Jointly Continuous Random Variables - 3
- Lecture 44 - Conditional CDF
- Lecture 45 - Transformation of Random Variables - 1
- Lecture 46 - Transformation of Random Variables - 2; Independent Random Variables
- Lecture 47 - Sums of Discrete Random Variables
- Lecture 48 - Sums of Jointly Continuous Random Variables
- Lecture 49 - Sums of Random Number of Random Variables
- Lecture 50 - General Transformations of Random Variables
- Lecture 51 - Jacobian Formula
- Lecture 52 - Examples Illustrating the use of Jacobian Formula
- Lecture 53 - Introduction Integral and Expectation
- Lecture 54 - Definition of the Abstract Integral
- Lecture 55 - Simple Functions
- Lecture 56 - Computing Expectation using Simple Functions, Properties of Integrals
- Lecture 57 - Properties of Integrals (Continued....)
- Lecture 58 - Inclusion Exclusion Formula using Indicator RVs and Expectation
- Lecture 59 - Monotone Convergence Theorem - 1
- Lecture 60 - Monotone Convergence Theorem - 2
- Lecture 61 - Expectation of a Discrete Random Variable
- Lecture 62 - Examples of Expectation of Discrete Random Variables
- Lecture 63 - Expectation of Function of Random Variable
- Lecture 64 - Some Examples of Computing Expectation
- Lecture 65 - Fatou's Lemma
- Lecture 66 - Dominated Convergence Theorem
- Lecture 67 - Variance
- Lecture 68 - Covariance

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

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- Lecture 69 - Covariance Correlation Coefficient - 1
- Lecture 70 - Covariance Correlation Coefficient - 2
- Lecture 71 - Conditional Expectation
- Lecture 72 - Properties of Conditional Expectation
- Lecture 73 - MMSE Estimator
- Lecture 74 - Transforms
- Lecture 75 - Moment Generating Function - 1
- Lecture 76 - Moment Generating Function - 2
- Lecture 77 - Characteristic Function - 1
- Lecture 78 - Characteristic Function - 2
- Lecture 79 - Characteristic Function - 3
- Lecture 80 - Characteristic Function - 4
- Lecture 81 - Concentration Inequalities - 1
- Lecture 82 - Concentration Inequalities - 2
- Lecture 83 - Convergence of Random Variables - 1
- Lecture 84 - Convergence of Random Variables - 2
- Lecture 85 - Convergence of Random Variables - 3
- Lecture 86 - Convergence of Random Variables - 4
- Lecture 87 - Convergence of Random Variables - 5
- Lecture 88 - Convergence of Random Variables - 6
- Lecture 89 - Convergence Of Characteristic Functions
- Lecture 90 - Limit Theorems
- Lecture 91 - The Law of Large Numbers - 1
- Lecture 92 - The Law of Large Numbers - 2
- Lecture 93 - The Central Limit Theorem - 1
- Lecture 94 - The Central Limit Theorem - 2
- Lecture 95 - A Brief Overview of Multivariate Gaussians - 1
- Lecture 96 - A Brief Overview of Multivariate Gaussians - 2

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

NPTEL Video Course - Electrical Engineering - NOC:Analog Circuits

Subject Co-ordinator - Dr. Nagendra Krishnapura

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to the course
- Lecture 2 - Obtaining power gain
- Lecture 3 - Obtaining power gain using a linear two port?
- Lecture 4 - One port (two terminal) nonlinear element
- Lecture 5 - Nonlinear circuit analysis
- Lecture 6 - Small signal incremental analysis - graphical view
- Lecture 7 - Small signal incremental analysis
- Lecture 8 - Incremental equivalent circuit
- Lecture 9 - Large signal characteristics of a diode
- Lecture 10 - Analysis of diode circuits
- Lecture 11 - Small signal model of a diode
- Lecture 12 - Two port nonlinearity
- Lecture 13 - Small signal equivalent of a two port network
- Lecture 14 - Small signal equivalent circuit of a two port network
- Lecture 15 - Gain of a two port network
- Lecture 16 - Constraints on small signal parameters to maximize the gain
- Lecture 17 - Constraints on large signal characteristics to maximize the gain
- Lecture 18 - Implications of constraints in terms of the circuit equivalent
- Lecture 19 - MOS transistor-description
- Lecture 20 - MOS transistor large signal characteristics
- Lecture 21 - MOS transistor large signal characteristics - graphical view
- Lecture 22 - MOS transistor small signal characteristics
- Lecture 23 - Linear (Triode) region of the MOS transistor
- Lecture 24 - Small signal amplifier using the MOS transistor
- Lecture 25 - Basic amplifier structure
- Lecture 26 - Problems with the basic structure
- Lecture 27 - Adding bias and signal-ac coupling
- Lecture 28 - Common source amplifier with biasing
- Lecture 29 - Common source amplifier: Small signal equivalent circuit

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

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- Lecture 30 - Common source amplifier analysis: Effect of biasing components
- Lecture 31 - Constraint on the input coupling capacitor
- Lecture 32 - Constraint on the output coupling capacitor
- Lecture 33 - Dependence of  $I_D$  on  $V_{DS}$
- Lecture 34 - Small signal output conductance of a MOS transistor
- Lecture 35 - Effect of  $g_{ds}$  on a common source amplifier; Inherent gain limit of a transistor
- Lecture 36 - Variation of  $g_m$  with transistor parameters
- Lecture 37 - Variation of  $g_m$  with constant  $V_{GS}$  and constant drain current bias
- Lecture 38 - Negative feedback control for constant drain current bias
- Lecture 39 - Types of feedback for constant drain current bias
- Lecture 40 - Sense at the drain and feedback to the gate-Drain feedback
- Lecture 41 - Intuitive explanation of low sensitivity with drain feedback
- Lecture 42 - Common source amplifier with drain feedback bias
- Lecture 43 - Constraint on the gate bias resistor
- Lecture 44 - Constraint on the input coupling capacitor
- Lecture 45 - Constraint on the output coupling capacitor
- Lecture 46 - Input and output resistances of the common source amplifier with constant  $V_{GS}$  bias
- Lecture 47 - Current mirror
- Lecture 48 - Common source amplifier with current mirror bias
- Lecture 49 - Constraint on coupling capacitors and bias resistance
- Lecture 50 - Diode connected transistor
- Lecture 51 - Source feedback biasing
- Lecture 52 - Common source amplifier with source feedback bias
- Lecture 53 - Constraints on capacitor values
- Lecture 54 - Sensing at the drain and feeding back to the source
- Lecture 55 - Sensing at the source and feeding back to the gate
- Lecture 56 - Ensuring that transistor is in saturation
- Lecture 57 - Using a resistor instead of current source for biasing
- Lecture 58 - Controlled sources using a MOS transistor-Introduction
- Lecture 59 - Voltage controlled voltage source
- Lecture 60 - VCVS using a MOS transistor
- Lecture 61 - VCVS using a MOS transistor - Small signal picture
- Lecture 62 - VCVS using a MOS transistor - Complete circuit
- Lecture 63 - Source follower: Effect of output conductance; Constraints on coupling capacitors
- Lecture 64 - VCCS using a MOS transistor
- Lecture 65 - VCCS using a MOS transistor: Small signal picture
- Lecture 66 - VCCS using a MOS transistor: Complete circuit
- Lecture 67 - VCCS using a MOS transistor: AC coupling the output
- Lecture 68 - Source degenerated CS amplifier

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

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- Lecture 69 - CCCS using a MOS transistor
- Lecture 70 - CCCS using a MOS transistor: Small signal picture
- Lecture 71 - CCCS using a MOS transistor: Complete circuit
- Lecture 72 - C CVS using a MOS transistor
- Lecture 73 - C CVS using a MOS transistor: Gain
- Lecture 74 - C CVS using a MOS transistor: Input and output resistances
- Lecture 75 - C CVS using a MOS transistor: Complete circuit
- Lecture 76 - V CVS using an opamp
- Lecture 77 - C CVS using an opamp
- Lecture 78 - Negative feedback and virtual short in an opamp
- Lecture 79 - Negative feedback and virtual short in a transistor
- Lecture 80 - Constraints on controlled sources using opamps and transistors
- Lecture 81 - Quick tour of amplifying devices
- Lecture 82 - Signal swing limits in amplifiers
- Lecture 83 - Swing limit due to transistor entering triode region
- Lecture 84 - Swing limit due to transistor entering cutoff region
- Lecture 85 - Swing limit calculation example
- Lecture 86 - Swing limits-more calculations
- Lecture 87 - pMOS transistor
- Lecture 88 - Small signal model of the pMOS transistor
- Lecture 89 - Common source amplifier using the pMOS transistor
- Lecture 90 - Swing limits of the pMOS common source amplifier
- Lecture 91 - Biasing a pMOS transistor at a constant current; pMOS current mirror
- Lecture 92 - Converting nMOS transistor circuits to pMOS
- Lecture 93 - Bias current generation
- Lecture 94 - Examples of more than one transistor in feedback
- Lecture 95 - Gain limitation in a common source amplifier with resistive load
- Lecture 96 - nMOS active load for pMOS common source amplifier
- Lecture 97 - CMOS inverter
- Lecture 98 - Large signal characteristics of pMOS CS amplifier with nMOS active load
- Lecture 99 - Large signal characteristics of nMOS CS amplifier with pMOS active load
- Lecture 100 - Large signal characteristics of a CMOS inverter
- Lecture 101 - Active load amplifiers as digital gates
- Lecture 102 - Sensitivity of output bias to input bias in a CMOS inverter
- Lecture 103 - Self biasing a CMOS inverter
- Lecture 104 - An application of self biased inverters
- Lecture 105 - Current consumption of a self-biased inverter; Current biasing
- Lecture 106 - Amplifying a difference signal; Differential pair
- Lecture 107 - Differential pair-small signal basics

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

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- Lecture 108 - Biasing a differential pair
- Lecture 109 - Differential pair with differential excitation
- Lecture 110 - Differential pair with a current mirror load
- Lecture 111 - Differential pair with a current mirror load - operating point
- Lecture 112 - Differential pair with a current mirror load - Norton equivalent current
- Lecture 113 - Differential pair with a current mirror load - Norton equivalent resistance
- Lecture 114 - Common mode gain
- Lecture 115 - Single stage opamp
- Lecture 116 - Single stage opamp: Input common mode swing limits
- Lecture 117 - Single stage opamp: Output swing limits
- Lecture 118 - Which transistor type to use for the second stage?
- Lecture 119 - Small signal gain
- Lecture 120 - DC negative feedback biasing of all stages
- Lecture 121 - DC negative feedback biasing of all stages (Continued...)
- Lecture 122 - Small signal model
- Lecture 123 - Swing limits
- Lecture 124 - Systematic offset; How to eliminate it
- Lecture 125 - Bipolar junction transistor(BJT): Large signal model
- Lecture 126 - BJT model for calculating operating points
- Lecture 127 - BJT small signal model
- Lecture 128 - Biasing a BJT
- Lecture 129 - Biasing a BJT, (Continued...)
- Lecture 130 - Amplifiers using BJTs
- Lecture 131 - PNP transistor

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

NPTEL Video Course - Electrical Engineering - NOC:Introduction to Non Linear Dynamics

Subject Co-ordinator - Prof. Gaurav Raina

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - A brief introduction to modelling  
Lecture 2 - Dynamics and Nonlinear systems  
Lecture 3 - 1-Dimensional Flows, Flows on the Line, Lecture 1  
Lecture 4 - 1-Dimensional Flows, Flows on the Line, Lecture 2  
Lecture 5 - 1-Dimensional Flows, Flows on the Line, Lecture 3  
Lecture 6 - 1-Dimensional Flows, Flows on the Line, Lecture 4  
Lecture 7 - 1-Dimensional Flows, Flows on the Line, Lecture 5  
Lecture 8 - 1-Dimensional Flows, Flows on the Line, Lecture 6  
Lecture 9 - 1-Dimensional Flows, Bifurcations, Lecture 1  
Lecture 10 - 1-Dimensional Flows, Bifurcations, Lecture 2  
Lecture 11 - 1-Dimensional Flows, Bifurcations, Lecture 3  
Lecture 12 - 1-Dimensional Flows, Bifurcations, Lecture 4  
Lecture 13 - 1-Dimensional Flows, Bifurcations, Lecture 5  
Lecture 14 - 1-Dimensional Flows, Bifurcations, Lecture 6  
Lecture 15 - 1-Dimensional Flows, Flows on the Circle, Lecture 1  
Lecture 16 - 1-Dimensional Flows, Flows on the Circle, Lecture 2  
Lecture 17 - 2-Dimensional Flows, Linear Systems, Lecture 1  
Lecture 18 - 2-Dimensional Flows, Linear Systems, Lecture 2  
Lecture 19 - 2-Dimensional Flows, Linear Systems, Lecture 3  
Lecture 20 - 2-Dimensional Flows, Linear Systems, Lecture 4  
Lecture 21 - 2-Dimensional Flows, Phase Plane, Lecture 1  
Lecture 22 - 2-Dimensional Flows, Phase Plane, Lecture 2  
Lecture 23 - 2-Dimensional Flows, Phase Plane, Lecture 3  
Lecture 24 - 2-Dimensional Flows, Limit Cycles, Lecture 1  
Lecture 25 - 2-Dimensional Flows, Limit Cycles, Lecture 2  
Lecture 26 - 2-Dimensional Flows, Limit Cycles, Lecture 3  
Lecture 27 - 2-Dimensional Flows, Bifurcations, Lecture 1  
Lecture 28 - 2-Dimensional Flows, Bifurcations, Lecture 2  
Lecture 29 - 2-Dimensional Flows, Bifurcations, Lecture 3

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

NPTEL Video Course - Electrical Engineering - NOC:Control Engineering

Subject Co-ordinator - Prof. Ramkrishna.P

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Systems and Control

Lecture 2 - Modelling of Systems

Lecture 3 - Elements of Modelling

Lecture 4 - Examples of Modelling

Lecture 5 - Solving Problems in Modelling of Systems

Lecture 6 - Laplace Transforms

Lecture 7 - Inverse Laplace Transforms

Lecture 8 - Transfer Function of Modelling Block Diagram Representation

Lecture 9 - Solving Problems on Laplace Transforms and Transfer Functions

Lecture 10 - Block Diagram Reduction, Signal Flow Graphs

Lecture 11 - Solving Problems on Block Diagram Reduction, Signal Flow Graphs

Lecture 12 - Time Response Analyzsis of systems

Lecture 13 - Time Response specifications

Lecture 14 - Solving Problems on Time Response Analyzsis ans specifications

Lecture 15 - Stability

Lecture 16 - Routh Hurwitz Criterion

Lecture 17 - Routh Hurwitz Criterion T 1

Lecture 18 - Closed loop System and Stability

Lecture 19 - Root Locus Technique

Lecture 20 - Root Locus Plots

Lecture 21 - Root Locus Plots (Continued...)

Lecture 22 - Root Locus Plots (Continued...)

Lecture 23 - Root Locus Plots (Continued...)

Lecture 24 - Introduction to Frequency Response

Lecture 25 - Frequency Response Plots

Lecture 26 - Relative Stability

Lecture 27 - Bode plots

Lecture 28 - Basics of Control design Proportional, Integral and Derivative Actions

Lecture 29 - Basics of Control design Proportional, Integral and Derivative Actions

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

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- Lecture 30 - Problems on PID Controllers
- Lecture 31 - Basics of Control design Proportional, Integral and Derivative Actions
- Lecture 32 - Control design in time domain and discusses the lead compensator
- Lecture 33 - Improvement of the Transient Response using lead compensation
- Lecture 34 - Design of control using lag compensators
- Lecture 35 - The design of Lead-Lag compensators using root locus
- Lecture 36 - Introduction design of control in frequency domain
- Lecture 37 - Design of Lead Compensator using Bode Plots
- Lecture 38 - Design of Lag Compensators using Bode Plots
- Lecture 39 - Design of Lead-Lag Compensators using Bode plots
- Lecture 40 - Experimental Determination of Transfer Function
- Lecture 41 - Effect of Zeros on System Response
- Lecture 42 - Navigation - Stories and Some Basics
- Lecture 43 - Navigation - Dead Reckoning and Reference Frames
- Lecture 44 - Inertial Sensors and Their Characteristics
- Lecture 45 - Filter Design to Attenuate Inertial Sensor Noise
- Lecture 46 - Complementary Filter
- Lecture 47 - Complementary Filter - 1
- Lecture 48 - Introduction to State Space Systems
- Lecture 49 - Linearization of State Space Dynamics
- Lecture 50 - Linearization of State Space Dynamics - 1
- Lecture 51 - Controllability and Observability

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

NPTEL Video Course - Electronics and Communication Engineering - NOC:Analog IC Design

Subject Co-ordinator - Prof. S. Aniruddhan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to MOSFETs  
Lecture 2 - Simple MOSFET Circuits  
Lecture 3 - MOSFET Current Mirrors  
Lecture 4 - Cascode Amplifiers  
Lecture 5 - MOSFET in Integrated Circuits  
Lecture 6 - MOSFET Capacitances  
Lecture 7 - Noise  
Lecture 8 - Noise of Simple Circuits  
Lecture 9 - Systematic Mismatch  
Lecture 10 - Random Mismatch  
Lecture 11 - Differential Amplifiers  
Lecture 12 - Negative Feedback  
Lecture 13 - Stability of Negative Feedback Systems  
Lecture 14 - Dominant Pole Compensation  
Lecture 15 - Active Load  
Lecture 16 - One Stage OpAmps - 1  
Lecture 17 - One Stage OpAmps - 2  
Lecture 18 - One Stage OpAmps - 3  
Lecture 19 - Differential Amplifiers Offset  
Lecture 20 - One Stage OpAmps - Noise and Offset  
Lecture 21 - One Stage OpAmps - Slew Rate  
Lecture 22 - One Stage OpAmps - Datasheet  
Lecture 23 - One Stage OpAmps - Example 1  
Lecture 24 - One Stage OpAmps - Example 2  
Lecture 25 - Telescopic OpAmp - 1  
Lecture 26 - Telescopic OpAmp - 2  
Lecture 27 - Telescopic OpAmp - 3  
Lecture 28 - Telescopic OpAmp - 4  
Lecture 29 - Telescopic OpAmp - 5

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

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- Lecture 30 - Telescopic OpAmp - Datasheet
- Lecture 31 - Telescopic OpAmp - Design Example
- Lecture 32 - Folded-Cascode OpAmp - 1
- Lecture 33 - Folded-Cascode OpAmp - 2
- Lecture 34 - Folded-Cascode OpAmp - 3
- Lecture 35 - Folded-Cascode OpAmp - 4
- Lecture 36 - Folded-Cascode OpAmp - 5
- Lecture 37 - Negative feedback amplifier
- Lecture 38 - Step response, sinusoidal steady state response
- Lecture 39 - Loop gain and unity loop gain frequency; Opamp
- Lecture 40 - Opamp realization using controlled sources; Delay in the loop
- Lecture 41 - Negative feedback amplifier with ideal delay-small delays
- Lecture 42 - Negative feedback amplifier with ideal delay-large delays
- Lecture 43 - Negative feedback amplifier with parasitic poles and zeros
- Lecture 44 - Negative feedback amplifier with parasitic poles and zeros; Nyquist criterion
- Lecture 45 - Nyquist criterion; Phase margin
- Lecture 46 - Phase margin
- Lecture 47 - Single stage opamp realization
- Lecture 48 - Two stage miller compensated opamp
- Lecture 49 - Two stage miller compensated opamp.
- Lecture 50 - Two and three stage miller compensated opamps; Feedforward compensated opamp
- Lecture 51 - Two Stage Opamp
- Lecture 52 - Two Stage Opamp ; Three Stage and Triple Cascade Opamps
- Lecture 53 - Common Mode Rejection Ratio ; Example
- Lecture 54 - Fully differential single stage opamp
- Lecture 55 - Common mode feedback
- Lecture 56 - Fully differential single stage opamp-2
- Lecture 57 - Fully differential two stage opamp; Fully differential versus pseudo-differential

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

NPTEL Video Course - Electrical Engineering - NOC:Probability Foundations for Electrical Engineers

Subject Co-ordinator - Prof. R.Aravind, Dr. Andrew Thangaraj

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Experiments, Outcomes and Events

Lecture 2 - Examples

Lecture 3 - Operations on Events

Lecture 4 - Examples

Lecture 5 - Sigma Fields and Probability

Lecture 6 - Discrete Sample Spaces

Lecture 7 - Union and Partition

Lecture 8 - Examples

Lecture 9 - Definition and Basic Properties

Lecture 10 - Bayes' Rule for Partitions

Lecture 11 - Examples

Lecture 12 - Example of Detection

Lecture 13 - Example

Lecture 14 - Independence of Events

Lecture 15 - Examples

Lecture 16 - Combining Independent Experiments

Lecture 17 - Conditional Independence

Lecture 18 - Examples and Computations with Conditional Independence

Lecture 19 - Binomial and Geometric Models

Lecture 20 - Examples

Lecture 21 - Definition and Discrete Setting

Lecture 22 - Random Variables and Events

Lecture 23 - Examples

Lecture 24 - Important distributions

Lecture 25 - Examples

Lecture 26 - Real-life modeling example

Lecture 27 - More Distributions

Lecture 28 - Conditional PMFs, Conditioning on an event, Indicator random variables

Lecture 29 - Example

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

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- Lecture 30 - Multiple random variables and joint distribution
- Lecture 31 - Example
- Lecture 32 - Marginal PMF
- Lecture 33 - Trinomial joint PMF
- Lecture 34 - Events and Conditioning with Two Random Variables
- Lecture 35 - Example
- Lecture 36 - Independent random variables
- Lecture 37 - More on independence
- Lecture 38 - Example
- Lecture 39 - Addition of Random Variables
- Lecture 40 - Sum, Difference and Max of Two Random Variables
- Lecture 41 - More Computations
- Lecture 42 - Example
- Lecture 43 - Real line as sample space
- Lecture 44 - Probability density function (pdf)
- Lecture 45 - Cumulative distribution function (CDF)
- Lecture 46 - Continuous random variables
- Lecture 47 - pdf and CDF of continuous random variables
- Lecture 48 - Spinning pointer example
- Lecture 49 - Important continuous distributions
- Lecture 50 - More continuous distributions
- Lecture 51 - Two-dimensional real sample space
- Lecture 52 - Joint pdf and joint CDF
- Lecture 53 - More on assigning probability to regions of x-y plain
- Lecture 54 - Darts example and marginal pdfs
- Lecture 55 - Independence to two continuous random variables
- Lecture 56 - Examples
- Lecture 57 - Prob[  $X > Y$  ]
- Lecture 58 - Transformations of random variables
- Lecture 59 - CDF method
- Lecture 60 - pdf method
- Lecture 61 - Examples
- Lecture 62 - One-to-one transformations
- Lecture 63 - Expected Value or Mean of a Random Variable
- Lecture 64 - Properties of Expectation
- Lecture 65 - Expectation Computations for Important Distributions
- Lecture 66 - Variance
- Lecture 67 - Examples of Variance
- Lecture 68 - Expectations with Two Random Variables

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

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- Lecture 69 - Correlation and Covariance
- Lecture 70 - Examples
- Lecture 71 - Examples
- Lecture 72 - Examples
- Lecture 73 - Live Session

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

NPTEL Video Course - Electrical Engineering - NOC:Introduction to Photonics

Subject Co-ordinator - Prof. Balaji Srinivasan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Photonics  
Lecture 2 - Diffraction and Interference  
Lecture 3 - Tutorial on Ray Optics and Wave Optics  
Lecture 4 - Lab Demonstration  
Lecture 5 - Interferometers  
Lecture 6 - Coherence  
Lecture 7 - Spatial and Temporal Coherence  
Lecture 8 - Tutorial on Wave Optics  
Lecture 9 - Lab Demonstration  
Lecture 10 - Electromagnetic Optics  
Lecture 11 - Fiber Optics  
Lecture 12 - Photon Properties  
Lecture 13 - Lab Demonstration  
Lecture 14 - Photon Optics  
Lecture 15 - Tutorial on Photon optics  
Lecture 16 - Photon interaction - 1  
Lecture 17 - Photon interaction - 2  
Lecture 18 - Lab Demonstration  
Lecture 19 - Optical Amplification  
Lecture 20 - Three Level systems  
Lecture 21 - Four Level Systems  
Lecture 22 - EDFA Introduction  
Lecture 23 - EDFA Tutorial  
Lecture 24 - Lasers Part - 1  
Lecture 25 - Lab Demonstration  
Lecture 26 - Lasers part- 2  
Lecture 27 - Lasers part- 3  
Lecture 28 - Lasers part- 4  
Lecture 29 - Lab Demonstration

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

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- Lecture 30 - Semiconductor light Source and detector - Band structure
- Lecture 31 - Semiconductor light Source and detector - Light emission
- Lecture 32 - Semiconductor light Source and detector LED Characteristics
- Lecture 33 - Lab Demonstration
- Lecture 34 - Semiconductor light Source and detector Laser Characteristics
- Lecture 35 - Semiconductor Detectors - 1
- Lecture 36 - Semiconductor Detectors - 2
- Lecture 37 - Semiconductor Detectors - 3
- Lecture 38 - Lab Demonstration
- Lecture 39 - Semiconductor Detectors - 4
- Lecture 40 - Light manipulation-Mallus' Law
- Lecture 41 - Light manipulation-Birefringence
- Lecture 42 - Light manipulation-Faraday Rotation
- Lecture 43 - Lab Demonstration
- Lecture 44 - Non-linear optics-Pockels effect
- Lecture 45 - Non-linear optics-Kerr Effect
- Lecture 46 - Lab Demonstration
- Lecture 47 - Non-linear optics-stimulated Brillouin scattering
- Lecture 48 - Non-linear optics-stimulated Raman scattering

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

NPTEL Video Course - Electrical Engineering - NOC:Multirate DSP

Subject Co-ordinator - Prof. David Kovil Pillai

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to Multirate DSP - Part 1
- Lecture 2 - Introduction to Multirate DSP - Part 2
- Lecture 3 - Sampling and Nyquist criterion - Part 1
- Lecture 4 - Sampling and Nyquist criterion - Part 2
- Lecture 5 - Signal Reconstruction - Part 1
- Lecture 6 - Signal Reconstruction - Part 2
- Lecture 7 - Reconstruction filter - Part 1
- Lecture 8 - Reconstruction filter - Part 2
- Lecture 9 - Discrete time processing of continuous time signal - Part 1
- Lecture 10 - Discrete time processing of continuous time signal - Part 2
- Lecture 11 - DT processing of CT signal example
- Lecture 12 - Time scaling- upsampler and downsampler - Part 1
- Lecture 13 - Time scaling- upsampler and downsampler - Part 2
- Lecture 14 - Upsampler and downsampler- continued - Part 1
- Lecture 15 - Upsampler and downsampler- continued - Part 2
- Lecture 16 - Decimator properties
- Lecture 17 - Properties of Upsampler and Downsampler
- Lecture 18 - Fractional sampling rate change - Part 1
- Lecture 19 - Fractional sampling rate change - Part 2
- Lecture 20 - Multiplexer/ demultiplexer interpretation
- Lecture 21 - Noble identities and polyphase decomposition - Part 1
- Lecture 22 - Noble identities and polyphase decomposition - Part 2
- Lecture 23 - Polyphase decomposition continued - Part 1
- Lecture 24 - Polyphase decomposition continued - Part 2
- Lecture 25 - Introduction to Multirate Filter Banks
- Lecture 26 - Applications of Multirate - Part 1
- Lecture 27 - Applications of Multirate - Part 2
- Lecture 28 - Spectral Analysis of Filter Bank - Part 1
- Lecture 29 - Spectral Analysis of Filter Bank - Part 2

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

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- Lecture 30 - DFT and High Resolution Spectral Analysis - Part 1
- Lecture 31 - DFT and High Resolution Spectral Analysis - Part 2
- Lecture 32 - Transmultiplexer and Maximally Decimated Filterbanks - Part 1
- Lecture 33 - Transmultiplexer and Maximally Decimated Filterbanks - Part 2
- Lecture 34 - Maximally Decimated Filterbanks 2 - Part 1
- Lecture 35 - Maximally Decimated Filterbanks 2 - Part 2
- Lecture 36 - Study of Two-channel filter bank
- Lecture 37 - Introduction to Quadrature Mirror Filters (QMF)
- Lecture 38 - 2-channel QMF Filter Bank Design
- Lecture 39 - Study of All-pass filters
- Lecture 40 - Study of All-pass lattice
- Lecture 41 - All-pass decomposition, the study of Mth band and Nyquist filters
- Lecture 42 - Study of two-channel filter bank with perfect reconstruction
- Lecture 43 - First part name
- Lecture 44 - First part name
- Lecture 45 - Capacity of wireless channels - CSIR - Part 1
- Lecture 46 - Capacity of wireless channels - CSIT - Part 2
- Lecture 47 - Capacity of wireless channels - Formulation of capacity calculation - Part 3
- Lecture 48 - Capacity of wireless channels - Formulation of capacity calculation (Continued...) - Part 1
- Lecture 49 - Capacity of wireless channels - Formulation of capacity calculation (Continued...) - Part 2
- Lecture 50 - Capacity of wireless channels - Time-invariant Frequency selective channel - Part 3
- Lecture 51 - Capacity of wireless channels - Time-varying Frequency selective channels - Part 1
- Lecture 52 - Multi-rate DSP framework for Multi-carrier Modulation - Part 2
- Lecture 53 - MCM with overlapping spectra - Part 1
- Lecture 54 - Recap of multirate DSP concepts for building OFDM - Part 2
- Lecture 55 - Introduction to Redundancy and it's implementation in multi-rate framework - Part 3
- Lecture 56 - M-channel multicarrier Transceiver - Part 1
- Lecture 57 - M-channel multicarrier Transceiver - Part 2
- Lecture 58 - M-channel multicarrier Transceiver - Part 3
- Lecture 59 - Pseudo-circulant structure - Part 1
- Lecture 60 - Pseudo-circulant structure - Part 2
- Lecture 61 - MCM impairments and CP - Part 1
- Lecture 62 - MCM impairments and CP - Part 2
- Lecture 63 - Orthogonal Frequency Division Multiplexing - Part 1
- Lecture 64 - Orthogonal Frequency Division Multiplexing - Part 2
- Lecture 65 - Review of OFDM with CP
- Lecture 66 - Review of Lec 1-28
- Lecture 67 - OFDM applications - Quantization - Part 1
- Lecture 68 - OFDM applications - Quantization - Part 2

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

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Lecture 69 - Some more applications of MDSP

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

NPTEL Video Course - Electrical Engineering - NOC:LDPC and Polar Codes in 5G Standard

Subject Co-ordinator - Dr. Andrew Thangaraj

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Additive White Gaussian Noise (AWGN) Channel and BPSK
- Lecture 2 - Bit Error Rate (BER) and Signal to Noise Ratio (SNR)
- Lecture 3 - Error Correction Coding in a Digital Communication System
- Lecture 4 - Complementary Error Function
- Lecture 5 - Simulation of Uncoded BPSK and BER v/s Eb/N0 plot Generation in MATLAB/Octave
- Lecture 6 -  $n = 3$  Repetition Code
- Lecture 7 - Implementation of  $n = 3$  Repetition Code in MATLAB
- Lecture 8 - (7,4) Hamming Code
- Lecture 9 - A Brief Introduction to Linear Block Codes
- Lecture 10 - Simulation of (7,4) Hamming Code in MATLAB
- Lecture 11 - Low Density Parity Check Codes
- Lecture 12 - LDPC Codes in 5G
- Lecture 13 - Encoding LDPC codes in 5G
- Lecture 14 - MATLAB programs for encoding LDPC codes
- Lecture 15 - Log-Likelihood Ratio and Soft Input and Soft Output (SISO) Decoder for the Repetition Code
- Lecture 16 - Soft Input and Soft Output (SISO) Decoder for the Single Parity Check (SPC) Code
- Lecture 17 - Illustration of SISO decoder for (3,2) SPC code and min-sum approximation
- Lecture 18 - SISO decoder for a general  $(n,n-1)$  SPC code
- Lecture 19 - Soft-Input Soft-Output Iterative Message Passing Decoder for LDPC Codes
- Lecture 20 - A Toy Example Illustration of the SISO Minsum Iterative Message Passing Decoder
- Lecture 21 - Modifications to the Decoder
- Lecture 22 - Implementation of SISO Layered Minsum Iterative Message Passing Decoder in MATLAB
- Lecture 23 - Debugging and Improvements to the MATLAB Implementation
- Lecture 24 - Rate Matching in LDPC Codes using Puncturing and Shortening
- Lecture 25 - Implementation of Fixed Point Quantization and Offset Minsum in the Decoder
- Lecture 26 - Introduction to Polar Codes
- Lecture 27 - Channel Polarization, Definition of  $(N,K)$  Polar Code and Encoding
- Lecture 28 - MATLAB Implementation for Encoding Polar Codes
- Lecture 29 - Successive Cancellation (SC) Decoder for Polar Codes

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

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- Lecture 30 - Successive Cancellation (SC) Decoder for a General (N,K) Polar Code
- Lecture 31 - MATLAB Implementation of Successive Cancellation Decoder - Part 1
- Lecture 32 - MATLAB Implementation of Successive Cancellation Decoder - Part 2
- Lecture 33 - Successive Cancellation List Decoding
- Lecture 34 - Fixed Point Quantization for SC Decoder and LDPC Decoder
- Lecture 35 - MATLAB Implementation of Successive Cancellation List Decoding
- Lecture 36 - Rate Matching for LDPC codes
- Lecture 37 - Performance Comparison of LDPC codes and Polar Codes in 5G

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

NPTEL Video Course - Electrical Engineering - NOC:Electromagnetic Compatibility, EMC

Subject Co-ordinator - Prof. Daniel Mansson, Prof. Rajeev Thottappillil

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to EMC - Definitions

Lecture 2 - Introduction to EMC - Sources, units etc

Lecture 3 - Electromagnetic principles - Faraday's and Ampere's equations

Lecture 4 - Electromagnetic principles - Gauss's equation, boundary conditions

Lecture 5 - Electromagnetic principles - Uniform plane wave

Lecture 6 - Electromagnetic principles - Transmission lines

Lecture 7 - Electromagnetic principles - Dipoles

Lecture 8 - High-frequency behaviour of components - Conductors

Lecture 9 - High-frequency behaviour of components - Capacitors, inductors, resistors

Lecture 10 - High-frequency behaviour of components - Mechanical switches and transformers

Lecture 11 - Crosstalk or near-field coupling - Capacitive coupling, inductive coupling, common-impedance coupling

Lecture 12 - Crosstalk or near-field coupling - Crosstalk combinations

Lecture 13 - Crosstalk or near-field coupling - Coupling to shielded cables

Lecture 14 - Electromagnetic coupling in the far-field

Lecture 15 - Field Coupling - Exercises

Lecture 16 - Solutions to EMC problems - Lay out and control of interfaces

Lecture 17 - Solutions to EMC problems - Grounding or earthing

Lecture 18 - Solutions to EMC problems - Electromagnetic Shielding

Lecture 19 - Solutions to EMC problems - Electromagnetic Shielding (Continued...)

Lecture 20 - Solutions to EMC problems - Shielded cables

Lecture 21 - Solutions to EMC problems - Filters and Surge protectors

Lecture 22 - Lightning Protection - Introduction

Lecture 23 - Lightning protection - Currents, charges and fields

Lecture 24 - Lightning Protection - Buildings

Lecture 25 - Lightning Protection - Towers, Lightning safety

Lecture 26 - EMC Requirements and Standard, Testing and Difficulties - 1

Lecture 27 - EMC Requirements and Standard, Testing and Difficulties - 2

Lecture 28 - Intentional Electromagnetic Interference or IEMI - 1

Lecture 29 - Intentional Electromagnetic Interference or IEMI - 2

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

NPTEL Video Course - Electrical Engineering - NOC:Mapping Signal Processing Algorithms to Architectures

Subject Co-ordinator - Prof. Nitin Chandrachoodan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Review of digital logic
- Lecture 3 - Timing and Power in digital circuits
- Lecture 4 - Implementation Costs and Metrics
- Lecture 5 - Example
- Lecture 6 - Example
- Lecture 7 - Architecture cost components
- Lecture 8 - Examples of Architectures
- Lecture 9 - Multi-objective Optimization
- Lecture 10 - Number representation
- Lecture 11 - Scientific notation and Floating point
- Lecture 12 - Basic FIR filter
- Lecture 13 - Serial FIR filter architectures
- Lecture 14 - Simple programmable architecture
- Lecture 15 - Block diagrams and SFGs
- Lecture 16 - Dataflow Graphs
- Lecture 17 - Iteration period
- Lecture 18 - FIR filter iteration period
- Lecture 19 - IIR filter iteration period
- Lecture 20 - Computation Model
- Lecture 21 - Constraint analysis for IPB computation
- Lecture 22 - Motivational examples for IPB
- Lecture 23 - General IPB computation
- Lecture 24 - Sample period calculation
- Lecture 25 - Parallel architecture
- Lecture 26 - Odd-even register reuse
- Lecture 27 - Power consumption
- Lecture 28 - Pipelining
- Lecture 29 - Time-invariant systems

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

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- Lecture 30 - Valid pipelining examples
- Lecture 31 - Feedforward cutsets
- Lecture 32 - Balanced pipeline
- Lecture 33 - Retiming basic concept
- Lecture 34 - Retiming basic concept
- Lecture 35 - (Missing Title)
- Lecture 36 - Resource sharing
- Lecture 37 - Changing iteration period
- Lecture 38 - Hardware assumptions and constraint analysis
- Lecture 39 - Mathematical formulation
- Lecture 40 - Examples with formulation
- Lecture 41 - Example
- Lecture 42 - Hardware architecture
- Lecture 43 - Review biquad folding sets
- Lecture 44 - Complete biquad hardware
- Lecture 45 - DEMO
- Lecture 46 - DEMO
- Lecture 47 - Obtaining a folding schedule
- Lecture 48 - ASAP schedule
- Lecture 49 - Utilization Efficiency
- Lecture 50 - ALAP schedule
- Lecture 51 - Iteration period bound and scheduling
- Lecture 52 - Retiming for scheduling
- Lecture 53 - Blocked schedules
- Lecture 54 - Overlapped schedules
- Lecture 55 - Improved blocked schedule
- Lecture 56 - Allocation, Binding and Scheduling
- Lecture 57 - DEMO
- Lecture 58 - DEMO
- Lecture 59 - Scheduling
- Lecture 60 - Example
- Lecture 61 - Heuristic approaches to scheduling
- Lecture 62 - Mathematical formulation
- Lecture 63 - ILP formulation
- Lecture 64 - List scheduling
- Lecture 65 - Hardware model
- Lecture 66 - Force Directed Scheduling
- Lecture 67 - DEMO
- Lecture 68 - DEMO

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

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Lecture 69 - DEMO  
Lecture 70 - Software Compilation  
Lecture 71 - Optimization Examples  
Lecture 72 - Loop optimizations - 1  
Lecture 73 - Loop optimizations - 2  
Lecture 74 - Loop optimizations - 3  
Lecture 75 - Software pipelining - 1  
Lecture 76 - Software pipelining - 2  
Lecture 77 - FFT Optimization  
Lecture 78 - Demo  
Lecture 79 - Background  
Lecture 80 - Demo  
Lecture 81 - Demo  
Lecture 82 - Demo  
Lecture 83 - Demo  
Lecture 84 - Background  
Lecture 85 - On-chip communication basics  
Lecture 86 - Many-to-Many communication  
Lecture 87 - AXI bus handshaking  
Lecture 88 - AXI bus (Continued...)  
Lecture 89 - Demo  
Lecture 90 - Demo  
Lecture 91 - Demo  
Lecture 92 - DMA and arbitration  
Lecture 93 - Network-on-chip basics  
Lecture 94 - NoC - Topologies and metrics  
Lecture 95 - NoC - Routing  
Lecture 96 - NoC - Switching and flow control  
Lecture 97 - Systolic Arrays - Background  
Lecture 98 - Systolic Arrays - Examples  
Lecture 99 - CORDIC algorithm  
Lecture 100 - Parallel implementation of FIR filters  
Lecture 101 - Unfolding Transformation  
Lecture 102 - Lookahead Transformation  
Lecture 103 - Introduction to GPUs and Matrix multiplication

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

NPTEL Video Course - Electrical Engineering - NOC:Linear System Theory

Subject Co-ordinator - Prof. Ramakrishna Pasumarthi

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Linear Systems

Lecture 2 - System Models

Lecture 3 - System Models - Part 1

Lecture 4 - System Models - Part 2

Lecture 5 - General Representation

Lecture 6 - Sets, Functions and Fields

Lecture 7 - Linear Algebra - Vector Spaces and Metric Spaces

Lecture 8 - Linear Algebra - Span, Basis and Subspaces

Lecture 9 - Linear Algebra - Linear Maps and Matrices

Lecture 10 - Linear Algebra - Fundamental Subspaces and Rank-Nullity

Lecture 11 - Tutorial 1 on Linear Algebra

Lecture 12 - Linear Algebra - Change of Basis and Similarity Transformation

Lecture 13 - Linear Algebra - Invariant Subspaces, Eigen Values and Eigen Vectors

Lecture 14 - Linear Algebra - Diagonalization and Jordan Forms

Lecture 15 - Linear Algebra - Eigen Decomposition and Singular Value Decomposition

Lecture 16 - Tutorial 2 on Linear Algebra

Lecture 17 - Solutions to LTI Systems

Lecture 18 - State Transition Matrix for LTI systems

Lecture 19 - Forced Reponse of Continuous and Discrete LTI system

Lecture 20 - State Transition Matrix and Solutions to LTV systems

Lecture 21 - Equilibrium Points

Lecture 22 - Limit Cycles and Linearisation

Lecture 23 - Stability Analysis and Types of Stability

Lecture 24 - Lyapunov Stability

Lecture 25 - Stability of Discrete Time Systems

Lecture 26 - Supplementary Lecture

Lecture 27 - Controllability and Reachability

Lecture 28 - Controllability Matrix and Controllable Systems

Lecture 29 - Controllability Tests

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

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- Lecture 30 - Controllability of Discrete Time Systems
- Lecture 31 - Controllable Decomposition
- Lecture 32 - Stabilizability
- Lecture 33 - Observability
- Lecture 34 - Gramians and Duality
- Lecture 35 - Observability for Discrete Time Systems and Observability Tests
- Lecture 36 - Observable Decomposition and Detectability
- Lecture 37 - Kalman Decomposition and Minimal Realisation
- Lecture 38 - Canonical Forms and State Feedback Control
- Lecture 39 - Control Design using Pole Placement
- Lecture 40 - Tutorial for Modules 9 and 10
- Lecture 41 - State Estimation and Output Feedback
- Lecture 42 - Design of Observer and Observer based Controller
- Lecture 43 - Optimal Control and Linear Quadratic Regulator (LQR)
- Lecture 44 - Feedback Invariant and Algebraic Riccati Equation
- Lecture 45 - Tutorial for Module 11
- Lecture 46 - Linear Matrix Inequalities
- Lecture 47 - Properties of LMIs and Delay LMIs

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

NPTEL Video Course - Electrical Engineering - NOC:Digital Signal Processing

Subject Co-ordinator - C. S. Ramalingam

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Signal Definition and Classification
- Lecture 2 - Affine Transform
- Lecture 3 - Recap of Affine Transform
- Lecture 4 - Even and Odd Parts of a Signal
- Lecture 5 - The Unit Step Sequence
- Lecture 6 - The Unit Impulse
- Lecture 7 - The Unit Impulse (Continued...)
- Lecture 8 - Exponential Signals and Sinusoids
- Lecture 9 - Sinusoids (Continued...)
- Lecture 10 - When are two sinusoids independent?
- Lecture 11 - Another Difference Between CT and DT Sinusoids
- Lecture 12 - System definition and properties (linearity)
- Lecture 13 - Time-invariance, memory, causality, and stability
- Lecture 14 - LTI systems, impulse response, and convolution
- Lecture 15 - Properties of convolution, system interconnections
- Lecture 16 - Java applet demo of convolution
- Lecture 17 - Systems governed by LCCDE
- Lecture 18 - FIR and IIR systems
- Lecture 19 - Karplus-Strong algorithm
- Lecture 20 - Z-transform definition and RoC
- Lecture 21 - Z-transform (Continued...)
- Lecture 22 - Poles and zeros
- Lecture 23 - Recursive implementation of FIR filters
- Lecture 24 - Convergence criterion
- Lecture 25 - Properties of the RoC
- Lecture 26 - DTFT definition and absolute summability
- Lecture 27 - Linearity
- Lecture 28 - Delay
- Lecture 29 - Exponential multiplication

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- Lecture 30 - Complex conjugation
- Lecture 31 - Time reversal
- Lecture 32 - Differentiation in the Z-domain
- Lecture 33 - Convolution in the time domain
- Lecture 34 - Relationship between  $x[n]$  and  $X(1)$
- Lecture 35 - Initial Value Theorem
- Lecture 36 - Final Value Theorem
- Lecture 37 - Multiplication in the time domain
- Lecture 38 - Parseval's Theorem
- Lecture 39 - Partial Fractions Method
- Lecture 40 - Power series method
- Lecture 41 - Contour Integral Method
- Lecture 42 - Contour Integral Method (Continued...)
- Lecture 43 - Inverse DTFT
- Lecture 44 - DTFT of Sequences that are not absolutely summable
- Lecture 45 - Response to  $\cos(\omega_0 n)$
- Lecture 46 - Causality and Stability
- Lecture 47 - Response to suddenly applied inputs
- Lecture 48 - Introduction to frequency response
- Lecture 49 - Magnitude response and its geometric interpretation
- Lecture 50 - Magnitude Response (Continued...)
- Lecture 51 - Response of a single complex zero/pole
- Lecture 52 - Resonator and Improved Resonator
- Lecture 53 - Notch filter
- Lecture 54 - Moving Average Filter
- Lecture 55 - Comb filter
- Lecture 56 - Phase response of a single complex zero
- Lecture 57 - Effect of crossing a unit circle zero, wrapped and unwrapped phase, resonator phase response
- Lecture 58 - Allpass Filter
- Lecture 59 - Group delay and its physical interpretation
- Lecture 60 - Zero-phase filtering, effect on nonlinear phase on waveshape
- Lecture 61 - Zero-Phase Filtering, Linear Phase - 1
- Lecture 62 - Linear Phase - 2
- Lecture 63 - Linear Phase - 3
- Lecture 64 - Linear Phase - 3
- Lecture 65 - Linear Phase - 3
- Lecture 66 - Linear Phase - 4, Sampling - 1
- Lecture 67 - Linear Phase - 4, Sampling - 1
- Lecture 68 - Linear Phase - 4, Sampling - 1

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Lecture 69 - Sampling - 2  
Lecture 70 - Sampling - 3  
Lecture 71 - Sampling - 4  
Lecture 72 - Sampling - 4  
Lecture 73 - Sampling - 4  
Lecture 74 - The Discrete Fourier Transform - 1  
Lecture 75 - The Discrete Fourier Transform - 1  
Lecture 76 - The Discrete Fourier Transform - 2  
Lecture 77 - The Discrete Fourier Transform - 3  
Lecture 78 - The Discrete Fourier Transform - 3  
Lecture 79 - The Discrete Fourier Transform - 3  
Lecture 80 - The Discrete Fourier Transform - 4  
Lecture 81 - The Discrete Fourier Transform - 4  
Lecture 82 - The Discrete Fourier Transform - 4

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

NPTEL Video Course - Electrical Engineering - NOC:Computational Electromagnetics

Subject Co-ordinator - Prof. Uday Khankhoje

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Chain rule of differentiation
- Lecture 2 - Gradient, Divergence, and Curl operators
- Lecture 3 - Common theorems in vector calculus
- Lecture 4 - Corollaries of these theorems
- Lecture 5 - Mathematical History
- Lecture 6 - Different regimes of Maxwell's equations
- Lecture 7 - Different ways of solving them
- Lecture 8 - Maxwell's Equations
- Lecture 9 - Boundary Conditions
- Lecture 10 - Uniqueness Theorem
- Lecture 11 - Equivalence Theorem
- Lecture 12 - Simple Numerical Integration
- Lecture 13 - Interpolating a Function
- Lecture 14 - Gauss Quadrature
- Lecture 15 - Line Charge Problem
- Lecture 16 - Solving the Integral Equation
- Lecture 17 - Basis Functions
- Lecture 18 - Helmholtz Equation
- Lecture 19 - Solving Helmholtz Equation
- Lecture 20 - Huygen's principle and the Extinction theorem
- Lecture 21 - Formulating the integral equations
- Lecture 22 - Conclusions of surface integral equations
- Lecture 23 - Motivations for Green's functions
- Lecture 24 - A one-dimensional example
- Lecture 25 - 1-D example
- Lecture 26 - 2-D wave example
- Lecture 27 - 2-D wave example
- Lecture 28 - 2-D example
- Lecture 29 - 2-D example

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- Lecture 30 - 3-D example
- Lecture 31 - Motivation for MoM
- Lecture 32 - Linear Vector Spaces
- Lecture 33 - Formulating Method of Moments
- Lecture 34 - Surface Integral Equations
- Lecture 35 - Surface Integral Equations
- Lecture 36 - Surface Integral Equations
- Lecture 37 - Surface Integral Equations
- Lecture 38 - Volume Integral Equations
- Lecture 39 - Volume Integral Equations
- Lecture 40 - Volume Integral Equations
- Lecture 41 - Volume Integral Equations
- Lecture 42 - Surface integral equations for PEC
- Lecture 43 - Surface v/s volume integral equations
- Lecture 44 - Definition of radar cross-section
- Lecture 45 - Computational Considerations
- Lecture 46 - History and Overview of the FEM
- Lecture 47 - Basic framework of FEM
- Lecture 48 - 1D Basis Functions
- Lecture 49 - 2D Basis Functions
- Lecture 50 - Weak form of 1D-FEM - Part 1
- Lecture 51 - Weak form of 1D-FEM - Part 2
- Lecture 52 - Generating System of Equations for 1D FEM
- Lecture 53 - 1D wave equation
- Lecture 54 - 1D Wave Equation
- Lecture 55 - 1D Wave Equation
- Lecture 56 - 1D Wave Equation
- Lecture 57 - 2D FEM Shape Functions
- Lecture 58 - Converting to Weak Form (2D FEM)
- Lecture 59 - Radiation Boundary Condition
- Lecture 60 - Total field formulation
- Lecture 61 - Scattered field formulation
- Lecture 62 - Comparing total and scattered field formulation
- Lecture 63 - Matrix assembly - Part 1
- Lecture 64 - Matrix assembly - Part 2
- Lecture 65 - Computing Far Field
- Lecture 66 - Numerical Aspects of 2D FEM
- Lecture 67 - Summary of FEM Procedure
- Lecture 68 - Introduction to FDTD

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- Lecture 69 - 2D FDTD Formulation
- Lecture 70 - 2D FDTD Formulation
- Lecture 71 - 2D FDTD Formulation
- Lecture 72 - Stability Criteria - Part 1
- Lecture 73 - Stability Criteria - Part 2
- Lecture 74 - Stability Criteria - Higher Dimensions
- Lecture 75 - Accuracy Considerations - 1D
- Lecture 76 - Accuracy Considerations - Higher Dimensions
- Lecture 77 - Dealing with non-dispersive dielectric media
- Lecture 78 - Dealing with dispersive dielectric media
- Lecture 79 - Debye Model - Part 1
- Lecture 80 - Debye Model - Part 2
- Lecture 81 - Absorbing Boundary Conditions - 1D
- Lecture 82 - Absorbing Boundary Conditions - 2D
- Lecture 83 - Implementing ABC in FDTD
- Lecture 84 - Failure of ABC
- Lecture 85 - Perfectly Matched Layers (PML) - Introduction
- Lecture 86 - Implementing PML using Coordinate Stretching
- Lecture 87 - PML - Phase Matching
- Lecture 88 - PML - Tangential Boundary Conditions
- Lecture 89 - Perfectly Matched Interface
- Lecture 90 - PML theory - Summary
- Lecture 91 - Implementing PML into FDTD - Part 1
- Lecture 92 - Implementing PML into FDTD - Part 2
- Lecture 93 - Sources in FDTD - Currents
- Lecture 94 - Sources in FDTD - Part 2
- Lecture 95 - Summary of FDTD
- Lecture 96 - MEEP
- Lecture 97 - Inverse Problems - Introduction
- Lecture 98 - Inverse Problems - Mathematical Formulation
- Lecture 99 - Inverse Problems - Challenges
- Lecture 100 - Inverse Problems - Non-Linearity
- Lecture 101 - Inverse Problems - Summary
- Lecture 102 - Antennas - Potential formulation
- Lecture 103 - Antennas - Hertz Dipole - Part 1
- Lecture 104 - Antennas - Hertz Dipole - Part 2
- Lecture 105 - Antennas - Radiation Patterns
- Lecture 106 - Antennas - Motivation for CEM
- Lecture 107 - Antennas - Pocklington's Integral Equation - Part 1

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- Lecture 108 - Antennas - Pocklington's Integral Equation - Part 2
- Lecture 109 - Antennas - Source Modeling
- Lecture 110 - Antennas - Circuit Model
- Lecture 111 - Antennas - MoM details
- Lecture 112 - Antennas - Mutual Coupling - Part 1
- Lecture 113 - Antennas - Mutual Coupling - Part 2
- Lecture 114 - Hybrid Methods - Motivation
- Lecture 115 - Finite Element-Boundary Integral - Part 1
- Lecture 116 - Finite Element-Boundary Integral - Part 2
- Lecture 117 - Finite Element-Boundary Integral - Part 3

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

NPTEL Video Course - Electrical Engineering - NOC:Transmission Lines and Electromagnetic Waves

Subject Co-ordinator - Dr. Ananth Krishnan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Transmission lines
- Lecture 2 - Lossless Transmission lines
- Lecture 3 - Introduction to finite difference method
- Lecture 4 - Octave simulation of wave equation
- Lecture 5 - Octave simulation of Telegrapher's equation
- Lecture 6 - Reflections and reflection coefficient
- Lecture 7 - AC signals in loss-less transmission lines
- Lecture 8 - Transmission lines with losses
- Lecture 9 - Octave simulation of Transmission lines with losses
- Lecture 10 - Voltage reflection coefficient and standing wave ratio
- Lecture 11 - Graphical representation of reflection coefficient
- Lecture 12 - Impedance matching using Smith chart
- Lecture 13 - Demonstration of Impedance matching using VNA
- Lecture 14 - Transmission Line Limitations and Maxwell's Equation
- Lecture 15 - Maxwell's Curl Equation
- Lecture 16 - Octave simulation of an Electromagnetic Wave Equation
- Lecture 17 - Polarisation of an Electromagnetic Wave
- Lecture 18 - Octave Simulation of different types of Polarisation
- Lecture 19 - Electromagnetic Waves in a conductive Medium
- Lecture 20 - Plane Waves
- Lecture 21 - Plane Waves at normal incidence
- Lecture 22 - Plane waves at Oblique Incidence - I
- Lecture 23 - Plane waves at Oblique Incidence - II
- Lecture 24 - Plane waves at Oblique Incidence - III
- Lecture 25 - Octave simulation of perpendicular polarisation
- Lecture 26 - Octave simulation of perpendicular polarisation (Continued...)
- Lecture 27 - Dielectric-ideal conductor interface
- Lecture 28 - Parallel plate waveguide
- Lecture 29 - Rectangular Waveguide

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

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- Lecture 30 - Octave simulation of modes of a Rectangular Waveguide
- Lecture 31 - Phase Velocity and Group velocity
- Lecture 32 - Octave simulation of Field pattern of a parallel plate waveguide
- Lecture 33 - Cavity resonator and Real life applications of waveguides and cavity



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

NPTEL Video Course - Electrical Engineering - NOC:Digital IC Design

Subject Co-ordinator - Prof. Janakiraman

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction - Digital IC Design  
Lecture 2 - PN Junction  
Lecture 3 - MOS Capacitor Threshold Voltage  
Lecture 4 - MOS Transistor Current Expression  
Lecture 5 - Body Effect and I-V Plots  
Lecture 6 - Short Channel Transistors - Channel Length Modulation  
Lecture 7 - Velocity Saturation and Level-1 SPICE Model  
Lecture 8 - Drain Induced Barrier Lowering  
Lecture 9 - Sub-Threshold Leakage  
Lecture 10 - Substrate and Gate Leakage  
Lecture 11 - The PMOS Transistor  
Lecture 12 - Transistor Capacitance - 1  
Lecture 13 - Transistor Capacitance - 2  
Lecture 14 - CMOS Inverter Construction  
Lecture 15 - Voltage Transfer Characteristics  
Lecture 16 - Load Line Analysis  
Lecture 17 - Trip Point for Short Channel Device Inverter  
Lecture 18 - Trip Point for Long Channel Device Inverter  
Lecture 19 - Noise Margin Analysis - 1  
Lecture 20 - Noise Margin Analysis - 2  
Lecture 21 - Noise Margin Analysis - 3  
Lecture 22 - Noise Margin Analysis-Long Channel Device Inverter - 1  
Lecture 23 - Noise Margin Analysis-Long Channel Device Inverter - 2  
Lecture 24 - Pass Transistors  
Lecture 25 - NMOS Transistor ON Resistance and Fall Delay  
Lecture 26 - Elmore Delay Model  
Lecture 27 - Inverter: Transient Response  
Lecture 28 - Inverter: Dynamic Power  
Lecture 29 - Inverter: Short Circuit Power

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

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- Lecture 30 - Inverter: Leakage Power and Transistor Stacks
- Lecture 31 - Stacking Effect and Sleep Transistors
- Lecture 32 - Ring Oscillators and Process Variations
- Lecture 33 - Implementing Any Boolean Logic Function
- Lecture 34 - Implementing Any Boolean Logic Function: Examples. Gate sizing
- Lecture 35 - Gate Sizing
- Lecture 36 - Logic Gate Capacitance
- Lecture 37 - Gate Delay
- Lecture 38 - Parasitic Delay
- Lecture 39 - Gate Delay with a Load Capacitance
- Lecture 40 - Logical Effort
- Lecture 41 - Gate Delay
- Lecture 42 - Path Delay Calculation and Optimization Formulation
- Lecture 43 - Path Delay Optimization: Intuition
- Lecture 44 - Path Delay Optimization: Example
- Lecture 45 - Buffer Insertion
- Lecture 46 - Input Ordering and Asymmetric Gates
- Lecture 47 - Skewed Gates
- Lecture 48 - Special Functions
- Lecture 49 - Pseudo NMOS Logic
- Lecture 50 - Pseudo NMOS Inverter
- Lecture 51 - Pseudo NMOS Logical Effort and CVSL
- Lecture 52 - Dynamic Circuits and Input Monotonicity
- Lecture 53 - Domino Logic and Weak Keepers
- Lecture 54 - Transmission Gate Logic
- Lecture 55 - Gate Sizing for Large Circuits
- Lecture 56 - Ripple Adder Introduction
- Lecture 57 - Full Adder Circuit Implementation
- Lecture 58 - Full Adder Optimization
- Lecture 59 - Carry Skip Adder
- Lecture 60 - Carry Select Adder
- Lecture 61 - Linear and Square Root Carry Select Adder
- Lecture 62 - Two's Complement Arithmetic
- Lecture 63 - Two's Complement Sign Extension
- Lecture 64 - Array Multiplier
- Lecture 65 - Array Multiplier - Timing Analysis
- Lecture 66 - Carry Save Multiplier
- Lecture 67 - Carry Save Multiplier - Signed Multiplication
- Lecture 68 - Introduction to Pipelining

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

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- Lecture 69 - Time Borrowing
- Lecture 70 - Master Slave Flip Flop
- Lecture 71 - Flop Timing Parameters
- Lecture 72 - Alternate Circuit Implementations
- Lecture 73 - Clock Overlap
- Lecture 74 - C2MOS Flop
- Lecture 75 - Flop Characterization
- Lecture 76 - Max and Min Delay of Flop Based Systems
- Lecture 77 - Flop Min Delay Constraint
- Lecture 78 - Latch - Max and Min Delay Constraints
- Lecture 79 - Latch - Timing Analysis with Skew
- Lecture 80 - Time Borrowing

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

NPTEL Video Course - Electrical Engineering - NOC:Power Management Integrated Circuits

Subject Co-ordinator - Prof. Qadeer Ahmad Khan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to PMIC - Part 1

Lecture 2 - Introduction to PMIC - Part 2

Lecture 3 - Linear versus Switching Regulators

Lecture 4 - Performance Parameters of Regulators

Lecture 5 - Local vs Remote Feedback, Point of Load Regulators

Lecture 6 - Kelvin Sensing, Droop Compensation

Lecture 7 - Current Regulator Applications, Introduction to Bandgap Voltage References, PTAT and CTAT voltage

Lecture 8 - Adding PTAT and CTAT Voltages

Lecture 9 - Bandgap Voltage Reference Circuit, Brokaw Bandgap Circuit

Lecture 10 - Sub-1-volt Bandgap Circuit

Lecture 11 - Generating Multiple Reference Voltages; Applications of Linear Regulators

Lecture 12 - Designing a Linear Regulator, Negative and Positive Feedback

Lecture 13 - First-Order Systems, Phase Margin

Lecture 14 - Closed-Loop Response of Second-Order Systems

Lecture 15 - Relationship between Damping Factor and Phase Margin, Frequency Compensation, MOS Parasitic Capa

Lecture 16 - Finding the Poles of the Error Amplifier - Part 1

Lecture 17 - Finding the Poles of the Error Amplifier - Part 2

Lecture 18 - Dominant Pole Frequency Compensation

Lecture 19 - Dominant Pole Compensation at No-Load

Lecture 20 - Dominant Pole Compensation using Miller Effect, RHP zero due to Miller Capacitor

Lecture 21 - Intuitive Method of Finding the Poles, Pole Splitting after Miller Compensation

Lecture 22 - Effect of RHP zero on Stability, Mitigating the Effect of RHP zero, LDO with NMOS Pass Element

Lecture 23 - Output Impedance of PMOS LDO

Lecture 24 - Line Regulation and PSRR of PMOS LDO

Lecture 25 - PSRR of PMOS versus PSRR of NMOS LDO

Lecture 26 - Sources of Error in Linear and Switching Regulators

Lecture 27 - Offset in Amplifiers; Real Life Analogy; Static Offset Cancellation

Lecture 28 - Dynamic Offset Cancellation Techniques (Chopping, Auto-zeroing)

Lecture 29 - Digital LDO, Technique to Avoid Limit Cycle Oscillations in Digital LDO

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

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- Lecture 30 - Hybrid LDO, Short-Circuit Protection
- Lecture 31 - Hiccup Mode and Foldback Current Limit
- Lecture 32 - Introduction to Switching Regulators
- Lecture 33 - volt-second Balance, Non-Idealities in the Power Stage of a Buck Converter
- Lecture 34 - Transformer Model of a Buck Converter, Conduction Efficiency, Efficiency of an LDO versus Efficiency
- Lecture 35 - Synchronous versus Non-Synchronous Switching Regulators, PWM Control Techniques
- Lecture 36 - Losses in Switching Regulators (Conduction Loss, Gate-Driver Switching Loss)
- Lecture 37 - Dead-Time Switching Loss in DC-DC Converters
- Lecture 38 - Hard Switching Loss in DC DC Converters
- Lecture 39 - Magnetic Loss in DC-DC Converters, Relative Significance of Losses as a Function of the Load Current
- Lecture 40 - Output Voltage Ripple of a Buck Converter
- Lecture 41 - Choosing the Inductor and Capacitor for a Buck Converter
- Lecture 42 - CCM Vs DCM Operation in DC DC Converters
- Lecture 43 - CCM DCM Boundary Condition, Voltage Conversion Ratio in DCM
- Lecture 44 - Concept of Pulse Frequency Modulation PFM
- Lecture 45 - Classification of Pulse Width Modulators
- Lecture 46 - DC - DC Converter Control Techniques, Stability Analysis of Voltage Mode Buck Converter - Part 1
- Lecture 47 - Stability Analysis of Voltage Mode Buck Converter - Part 2
- Lecture 48 - Stability Analysis of Voltage Mode Buck Converter - Part 3
- Lecture 49 - Dominant Pole Compensation (Type-I with Gm-C Architecture)
- Lecture 50 - Dominant Pole Compensation (Type-I with Op Amp-RC Architecture)
- Lecture 51 - Introduction to Type-II Compensation
- Lecture 52 - Type-II Compensator using Gm-C Architecture - Part 1
- Lecture 53 - Type-II Compensator using Gm-C Architecture - Part 2
- Lecture 54 - Type-II Compensator using Gm-C Architecture - Part 3
- Lecture 55 - Type-II Compensator using Op Amp-RC Architecture
- Lecture 56 - Introduction to Type-III Compensator
- Lecture 57 - Type-III Compensator using Op Amp-RC Architecture
- Lecture 58 - Simulation of DC-DC Converter with Type-III Compensator
- Lecture 59 - Type-III Compensator using Gm-C Architecture
- Lecture 60 - Feed-Forward Line Compensation, Loop Gain Compensation by Modulating Gm
- Lecture 61 - Designing a Buck Converter, Power Loss Budgeting
- Lecture 62 - Sizing Power MOSFETs
- Lecture 63 - Estimating Switching Losses and Choosing the Switching Frequency
- Lecture 64 - Choosing Inductance and Capacitance Values
- Lecture 65 - Choosing 'C' Depending on Factors that Limit the Load Transient Response
- Lecture 66 - Inductor and Capacitor Characteristics, Reducing the Effect of Capacitor ESL
- Lecture 67 - Gate Buffer and Non-Overlap Clock Generator in Gate-Driver Circuit
- Lecture 68 - Pulse-Width Modulator- Trailing Edge, Leading Edge and Dual Edge; Triangle Wave Generator

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

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- Lecture 69 - Average Ramp Voltage of Single-Edge PW Modulator, Design Considerations of EA
- Lecture 70 - Delays Associated with PW Modulator, PFM and PSM Operation, DCM Operation using NMOS
- Lecture 71 - Designing a Zero-Cross Comparator, Inverter-Based Auto-Zeroed Comparator, Simulation Demo
- Lecture 72 - Current Mode Control- Peak, Valley, Emulated; VMC versus CMC; Sub-Harmonic Oscillation
- Lecture 73 - Ramp-Adaptive Slope Compensation to Avoid Current Loop Instability
- Lecture 74 - Non-Linear Control of DC-DC Converters, Phase-Shift between  $i_L$  and  $v_C$
- Lecture 75 - Stabilising a Voltage-Mode Hysteretic Converter using  $R_{esr}$ , Relation between  $F_{sw}$  and the Hyste
- Lecture 76 - Hysteretic Converter - Simulation Demo
- Lecture 77 - Current-Mode Hysteretic Converter, Using R-C as Ripple Generator
- Lecture 78 - Controlling the Switching Frequency of a Hysteretic Converter, Delay in the Hysteretic Comparato
- Lecture 79 - Frequency and Voltage Regulation Loops in a Fixed-Frequency Hysteretic Converter
- Lecture 80 - Resetting the Capacitor Voltage in a Hysteretic Converter, Constant ON-Time Control
- Lecture 81 - Introduction to Boost Converter, RHP Zero in a Boost Converter
- Lecture 82 - Introduction to Buck-Boost Converter
- Lecture 83 - Tri-Mode Buck-Boost Converter (Buck, Buck-Boost and Boost)
- Lecture 84 - Boundary Conditions for Mode Transition in a Tri-Mode Buck-Boost Converter
- Lecture 85 - Generating Buck and Boost Duty Cycles in a Tri-Mode Buck-Boost Converter
- Lecture 86 - Introduction to Switched-Capacitor DC-DC Converters, Switched-Capacitor DC-DC Converter with  $V_o$
- Lecture 87 - Applications of Switched-Capacitor DC-DC Converters in Open-Loop, Regulating the Output using  $F_e$
- Lecture 88 - H-Bridge Switched-Capacitor DC-DC Converter, SC DC-DC converter with Multiple Gain Settings
- Lecture 89 - Current Sensing Techniques in DC-DC Converters
- Lecture 90 - Analog Layout Techniques - Part 1
- Lecture 91 - Analog Layout Techniques - Part 2
- Lecture 92 - Digital Control of DC-DC Converters, ADC Architectures
- Lecture 93 - Digital Pulse-Width Modulator Architectures, Adaptive Compensation
- Lecture 94 - Limitations of Analog and Digital Controllers, Time-Based Controller for Buck Converter
- Lecture 95 - Time-Based Controller for Buck Converter and for LDO, Issues with Time-Based Control
- Lecture 96 - Multi-Phase DC-DC Converters
- Lecture 97 - Dynamic Voltage and Frequency Scaling, Single Inductor Multiple Output (SIMO) DC-DC Converter
- Lecture 98 - LCD/AMOLED Display Drivers - Part 1
- Lecture 99 - LCD/AMOLED Display Drivers - Part 2
- Lecture 100 - LCD/AMOLED Display Drivers - Part 3
- Lecture 101 - LED Drivers for Camera Flash
- Lecture 102 - Li-Ion Battery and its Charging Phases
- Lecture 103 - Battery Charger IC

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

NPTEL Video Course - Electrical Engineering - NOC:DC Power Transmission Systems

Subject Co-ordinator - Prof. Krishna S

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Course contents
- Lecture 2 - Introduction
- Lecture 3 - Historical developments
- Lecture 4 - Power semiconductor devices
- Lecture 5 - General converter configuration
- Lecture 6 - Choice of converter configuration
- Lecture 7 - Choice of converter configuration
- Lecture 8 - Converter configuration for pulse number equal to 6
- Lecture 9 - Analysis of 6 pulse LCC neglecting inductance
- Lecture 10 - Analysis of 6 pulse LCC neglecting inductance
- Lecture 11 - Analysis of 6 pulse LCC neglecting inductance
- Lecture 12 - Fourier series - Part 1
- Lecture 13 - Fourier series - Part 2
- Lecture 14 - Analysis of 6 pulse LCC neglecting inductance
- Lecture 15 - Analysis of 6 pulse LCC neglecting inductance
- Lecture 16 - Definitions
- Lecture 17 - Commutation margin angle in a 6 pulse LCC neglecting inductance - Part 1
- Lecture 18 - Commutation margin angle in a 6 pulse LCC neglecting inductance - Part 2
- Lecture 19 - Instantaneous power on AC and DC sides in a 6 pulse LCC neglecting inductance
- Lecture 20 - Average power on AC and DC sides in a 6 pulse LCC neglecting inductance
- Lecture 21 - 6 pulse LCC with inductance
- Lecture 22 - 2 and 3 valve conduction mode of 6 pulse LCC
- Lecture 23 - 2 and 3 valve conduction mode of 6 pulse LCC
- Lecture 24 - 2 and 3 valve conduction mode of 6 pulse LCC
- Lecture 25 - 2 and 3 valve conduction mode of 6 pulse LCC
- Lecture 26 - Extinction angle
- Lecture 27 - Extinction angle
- Lecture 28 - 3 and 4 valve conduction mode of 6 pulse LCC
- Lecture 29 - Analysis of 3 and 4 valve conduction mode of 6 pulse LCC - Part 1

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

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- Lecture 30 - Analysis of 3 and 4 valve conduction mode of 6 pulse LCC - Part 2
- Lecture 31 - Analysis of 3 and 4 valve conduction mode of 6 pulse LCC - Part 3
- Lecture 32 - 3 valve conduction mode of 6 pulse LCC
- Lecture 33 - Commutation margin angle
- Lecture 34 - Normalization
- Lecture 35 - Characteristics of 6 pulse LCC - Part 1
- Lecture 36 - Characteristics of 6 pulse LCC - Part 2
- Lecture 37 - Steady state analysis of a general LCC - Part 1
- Lecture 38 - Steady state analysis of a general LCC - Part 2
- Lecture 39 - Steady state analysis of a general LCC - Application to 6 pulse LCC
- Lecture 40 - 6 pulse LCC with resistance included on the AC side
- Lecture 41 - 6 pulse LCC with resistance, inductance and voltage source on the DC side - Part 1
- Lecture 42 - 6 pulse LCC with resistance, inductance and voltage source on the DC side - Part 2
- Lecture 43 - Power factor
- Lecture 44 - Capacitor commutated converter - Part 1
- Lecture 45 - Capacitor commutated converter - Part 2
- Lecture 46 - 12 pulse LCC - Part 1
- Lecture 47 - 12 pulse LCC - Part 2
- Lecture 48 - Modes of operation of 12 pulse LCC
- Lecture 49 - Purposes of transformer
- Lecture 50 - Applications of DC transmission
- Lecture 51 - Types of DC link
- Lecture 52 - Types of DC link
- Lecture 53 - DC link control
- Lecture 54 - DC link control
- Lecture 55 - Considerations that influence selection of control
- Lecture 56 - Converter control characteristics
- Lecture 57 - MTDC systems
- Lecture 58 - Types of MTDC systems
- Lecture 59 - Non-characteristic harmonics
- Lecture 60 - Effect of firing angle errors
- Lecture 61 - Problems with harmonics
- Lecture 62 - Single tuned filter
- Lecture 63 - Design of single tuned filter - Part 1
- Lecture 64 - Design of single tuned filter - Part 2
- Lecture 65 - Double tuned and damped filters
- Lecture 66 - Reactive power requirement
- Lecture 67 - Comparison of AC and DC transmission



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

NPTEL Video Course - Electrical Engineering - NOC:Optical Engineering

Subject Co-ordinator - Prof. Shanti Bhattacharya

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Optical Engineering  
Lecture 2 - Geometric Optics Basics  
Lecture 3 - Refraction at a single surface  
Lecture 4 - Lab 1 Introduction to OSLO  
Lecture 5 - Stops and Rays  
Lecture 6 - Aperture stop - Part 1  
Lecture 7 - Aperture stop - Part 2  
Lecture 8 - Lab 2 OSLO  
Lecture 9 - Imaging equation for thick lens using ABCD matrix  
Lecture 10 - Ray Tracing Matrix - Part 1  
Lecture 11 - Ray Tracing Matrix - Part 2  
Lecture 12 - Principal Planes  
Lecture 13 - Lab 3 OSLO  
Lecture 14 - Tracing rays through optical pupils - Part 1  
Lecture 15 - Tracing rays through optical pupils - Part 2  
Lecture 16 - Aberrations  
Lecture 17 - Monochromatic Aberrations - Part 1  
Lecture 18 - Monochromatic Aberrations - Part 2  
Lecture 19 - Lab 4 - OSLO  
Lecture 20 - Chromatic Aberrations and Aberration correction  
Lecture 21 - Aberration correction  
Lecture 22 - Revisiting Ray intercept curves  
Lecture 23 - Lab 5 - OSLO  
Lecture 24 - Interesting Geometric phenomena and applications  
Lecture 25 - Gaussian beams introduction  
Lecture 26 - Gaussian beams  
Lecture 27 - Lab 6 - OSLO  
Lecture 28 - Transformation of a Gaussian beam  
Lecture 29 - Transformation of a Gaussian beam due to a lens and a mirror

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

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- Lecture 30 - Application of Gaussian beam equations
- Lecture 31 - Interferometry basics
- Lecture 32 - Interferometry basics - Part 1
- Lecture 33 - Introduction to Python
- Lecture 34 - Python - Part 2
- Lecture 35 - Introduction to Matlab
- Lecture 36 - Interferometry basics - Part 2
- Lecture 37 - Python - Part 3
- Lecture 38 - Matlab tutorial on interference
- Lecture 39 - Applications of interference - Part 1
- Lecture 40 - Holography
- Lecture 41 - Applications of interference
- Lecture 42 - Applications of Optical Engineering
- Lecture 43 - Diffractive Optics
- Lecture 44 - Diffraction Grating

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

NPTEL Video Course - Electrical Engineering - NOC:Nonlinear System Analysis

Subject Co-ordinator - Dr. Arun D. Mahindrakar, Prof. Ramkrishna Pasumarthy

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Examples of Nonlinear Physical Systems
- Lecture 2 - Math Preliminaries - Part 1
- Lecture 3 - Math Preliminaries - Part 2
- Lecture 4 - Math Preliminaries - Part 3
- Lecture 5 - Lipschitz Continuity and Contraction Mapping Theorem - Part 1
- Lecture 6 - Lipschitz Continuity and Contraction Mapping Theorem - Part 2
- Lecture 7 - Lipschitz Continuity and Contraction Mapping Theorem - Part 3
- Lecture 8 - Existence and Uniqueness Theorem of ODE - Part 1
- Lecture 9 - Existence and Uniqueness Theorem of ODE - Part 2
- Lecture 10 - Existence and Uniqueness Theorem of ODE - Part 3
- Lecture 11 - Existence and Uniqueness Theorem of ODE - Part 4
- Lecture 12 - Equilibrium Points
- Lecture 13 - Phase Portrait - Part 1
- Lecture 14 - Phase Portrait - Part 2
- Lecture 15 - Phase Portrait - Part 3
- Lecture 16 - Phase portrait of Nonlinear Systems
- Lecture 17 - Limit Cycles
- Lecture 18 - Limit Cycles - Examples - Part 1
- Lecture 19 - Limit Cycles - Examples - Part 2
- Lecture 20 - Introduction to Bifurcation Theory - 1
- Lecture 21 - Introduction to Bifurcation Theory - 2
- Lecture 22 - Necessary and Sufficient Conditions for Local Bifurcation
- Lecture 23 - Problems on Bifurcation Theory.
- Lecture 24 - Stability Notions
- Lecture 25 - Stability Notions
- Lecture 26 - Stability Notions
- Lecture 27 - Stability Notions
- Lecture 28 - Stability Analysis and types of stability
- Lecture 29 - Lypaunov Stability

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

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- Lecture 30 - Supplementary lecture
- Lecture 31 - Center Manifold Theorem
- Lecture 32 - Interconnection between non linearity and a linear system - Sector Nonlinearities And Aizermannâ s conjecture
- Lecture 33 - Counter example for Aizermannâ s conjecture
- Lecture 34 - Passivity inspiration - passive circuits - dissipation equality
- Lecture 35 - Dissipative Equality for circuit (Continued...)
- Lecture 36 - PR condition for passivity of SISO system
- Lecture 37 - Examples of PR transfer functions
- Lecture 38 - Relation between storage function and Lyapunov function - PR Lemma
- Lecture 39 - Proof of PR Lemma
- Lecture 40 - Proof (Continued...) using spectral factorization theorem
- Lecture 41 - PR definition for MIMO case
- Lecture 42 - PSD Storage function in PR Lemma and how to make it PD (strictly PR)
- Lecture 43 - KYP Theorem
- Lecture 44 - Passivity preservation under interconnection
- Lecture 45 - Aizermannâ s conjecture under passivity assumption is true
- Lecture 46 - Sector Nonlinearities and need for generalizing KYP Lemma
- Lecture 47 - Need for Loop transformations
- Lecture 48 - Loop Transformations - Part 1
- Lecture 49 - Loop Transformations - Part 2
- Lecture 50 - Circle criterion for PR
- Lecture 51 - Examples based on circle criterion and stability under circle transformations

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

NPTEL Video Course - Electrical Engineering - NOC:Signals and Systems

Subject Co-ordinator - Prof. Kushal K. Shah

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Real and Complex Number
- Lecture 2 - Sinusoid and Phasor
- Lecture 3 - Limits and Continuity
- Lecture 4 - Differentiation and Integration
- Lecture 5 - L'Hôpital's Rule
- Lecture 6 - LTI System Examples; Impedance
- Lecture 7 - Dirac Delta function; Impulse
- Lecture 8 - Continuous and Discrete Time Systems
- Lecture 9 - Even Signal; Odd Signal
- Lecture 10 - Orthogonality of Signals
- Lecture 11 - Shifting and Scaling in Continuous Time - I
- Lecture 12 - Shifting and Scaling in Continuous Time - II
- Lecture 13 - Shifting and Scaling in Discrete Time
- Lecture 14 - Signal and Noise
- Lecture 15 - Signals in the Physical World
- Lecture 16 - Signals and Sensory Perception
- Lecture 17 - Frequency Domain Representation
- Lecture 18 - Definition of Fourier Transform
- Lecture 19 - Fourier Transform
- Lecture 20 - Dirichlet Conditions
- Lecture 21 - Inverse Fourier Transform
- Lecture 22 - Fourier Transform
- Lecture 23 - Frequency-Time Uncertainty Relation
- Lecture 24 - Fourier Transform
- Lecture 25 - Fourier Transform
- Lecture 26 - Fourier Transform
- Lecture 27 - Fourier Transform
- Lecture 28 - Fourier Transform
- Lecture 29 - Fourier Transform

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

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- Lecture 30 - Fourier Transform of Noise
- Lecture 31 - Types of Noise
- Lecture 32 - Overview of Systems and General Properties
- Lecture 33 - Linearity and Time Invariance
- Lecture 34 - LTI System Examples
- Lecture 35 - Frequency Response of RLC circuits - I
- Lecture 36 - Frequency Response of RLC circuits - II
- Lecture 37 - LCCDE Representation of Continuous-Time LTI Systems
- Lecture 38 - Frequency Domain Representation of LCCDE Systems
- Lecture 39 - Time Domain Representation of LTI Systems
- Lecture 40 - Continuous-Time Convolution Integral
- Lecture 41 - Continuous-Time Convolution
- Lecture 42 - Continuous-Time Convolution
- Lecture 43 - Continuous-Time Convolution
- Lecture 44 - LTI Systems
- Lecture 45 - LTI Systems
- Lecture 46 - LTI Systems
- Lecture 47 - Fourier Transform in Complex Frequency Domain
- Lecture 48 - Laplace Transform
- Lecture 49 - Laplace Transform
- Lecture 50 - Laplace Transform
- Lecture 51 - Laplace Transform
- Lecture 52 - Laplace Analysis of LTI Systems
- Lecture 53 - Laplace Analysis of RLC Circuits - I
- Lecture 54 - Laplace Transform
- Lecture 55 - Laplace Transform
- Lecture 56 - Laplace Transform
- Lecture 57 - Laplace Analysis of LTI Systems
- Lecture 58 - Laplace Analysis of LTI Systems
- Lecture 59 - Laplace Analysis of First Order RLC Circuits
- Lecture 60 - Laplace Analysis of Second Order RLC Circuits
- Lecture 61 - Fourier Transform of Periodic Signals
- Lecture 62 - Fourier Series Representation in Continuous-Time
- Lecture 63 - Fourier Series Properties - I
- Lecture 64 - Fourier Series Properties - II
- Lecture 65 - LTI System Response for Periodic Input Signal
- Lecture 66 - Fourier Series in Continuous-Time
- Lecture 67 - Fourier Series in Continuous-Time
- Lecture 68 - Discrete-Time Convolution Sum

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

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- Lecture 69 - Discrete-Time Convolution Sum Examples and Properties
- Lecture 70 - LCCDE Representation of Discrete-Time LTI Systems
- Lecture 71 - Impulse Train Sampling
- Lecture 72 - Reconstruction of Continuous-Time Signal
- Lecture 73 - Nyquist Sampling Theorem and Aliasing
- Lecture 74 - Fourier Transform of Sampled Signals
- Lecture 75 - DTFT
- Lecture 76 - DTFT Properties I
- Lecture 77 - DTFT Properties II
- Lecture 78 - DTFT Properties III
- Lecture 79 - DTFT
- Lecture 80 - DTFT in Complex Frequency Domain
- Lecture 81 - Z-Transform
- Lecture 82 - Z-Transform Properties I
- Lecture 83 - Z-Transform Properties II
- Lecture 84 - Z-Transform Properties III
- Lecture 85 - Z-Transform
- Lecture 86 - Z-Transform
- Lecture 87 - Block Diagram Representation

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

NPTEL Video Course - Electrical Engineering - NOC:Linear Dynamical Systems

Subject Co-ordinator - Prof. Tushar Jain

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Response and state-space solution of Linear systems
- Lecture 2 - Solution of LTV systems
- Lecture 3 - Solution of LTI systems
- Lecture 4 - Equivalent State Equations
- Lecture 5 - Realization of LTI and LTV Systems
- Lecture 6 - Tutorial - 1
- Lecture 7 - Introduction to Stability Analysis
- Lecture 8 - Lyapunov Stability - Part I
- Lecture 9 - Lyapunov Stability - Part II
- Lecture 10 - Proof of Lyapunov stability theorem
- Lecture 11 - BIBO vs Lyapunov Stability
- Lecture 12 - BIBO vs Lyapunov Stability
- Lecture 13 - Tutorial - 2
- Lecture 14 - Introduction to Controllability
- Lecture 15 - Reachability and Controllability Gramians
- Lecture 16 - Controllability Matrix
- Lecture 17 - Discrete-time Reachability and Controllability Gramians
- Lecture 18 - Tests for controllability - I
- Lecture 19 - Tests for controllability - II
- Lecture 20 - Tutorial - 3
- Lecture 21 - Tests for controllability - III
- Lecture 22 - Tests for controllability - IV
- Lecture 23 - Controllable Decomposition - I
- Lecture 24 - Stabilizable Systems
- Lecture 25 - Tests for Stabilizability
- Lecture 26 - Tutorial - 4
- Lecture 27 - State Feedback - I
- Lecture 28 - State Feedback - II
- Lecture 29 - Lyapunov Method of State Feedback Design

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

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- Lecture 30 - Regulation and Tracking
- Lecture 31 - Tutorial - 5
- Lecture 32 - Robust Tracking and Disturbance Rejection
- Lecture 33 - State Feedback design for Multi-input systems
- Lecture 34 - Linear Quadratic Regulator
- Lecture 35 - Tutorial - 6
- Lecture 36 - Output feedback and observability
- Lecture 37 - Duality and Observability tests
- Lecture 38 - Decompositions and Detectability
- Lecture 39 - Minimal Realisations
- Lecture 40 - Observer Design and Output Feedback
- Lecture 41 - Observer Design and Output Feedback
- Lecture 42 - UIO
- Lecture 43 - Tutorial - 7 and 8 (combined)

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

NPTEL Video Course - Electrical Engineering - NOC:A brief Introduction of Micro-Sensors

Subject Co-ordinator - Prof. Santanu Talukder

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Microscale Sensors or MEMS

Lecture 2 - Scaling effect

Lecture 3 - Some Simple Mechanics

Lecture 4 - Basic Mechanics - Part 1

Lecture 5 - Basic Mechanics - Part 2

Lecture 6 - Basic Mechanics - Part 3

Lecture 7 - Electrostatics

Lecture 8 - Electrostatic force

Lecture 9 - Coupled electromechanics

Lecture 10 - Stiction

Lecture 11 - Si crystal structure

Lecture 12 - Si etching

Lecture 13 - KOH etching

Lecture 14 - TMAH etching

Lecture 15 - Deposition and Lithography

Lecture 16 - Lithography

Lecture 17 - Pressure sensor types, membrane, Piezoelectric sensing, capacitive sensing

Lecture 18 - Pressure Sensor - II

Lecture 19 - Pressure Sensor - III

Lecture 20 - Accelerometer - I

Lecture 21 - Accelerometer - II

Lecture 22 - Assignment 1

Lecture 23 - Assignment 2

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

NPTEL Video Course - Electrical Engineering - NOC:Fiber Optic Communication Technology

Subject Co-ordinator - Prof. Deepa Venkitesh

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to FOCT
- Lecture 2 - Communication through the ages
- Lecture 3 - Communication
- Lecture 4 - Communication
- Lecture 5 - Digital Communication for Optical Communication
- Lecture 6 - Digital modulation
- Lecture 7 - Digital modulation
- Lecture 8 - Optical communication system
- Lecture 9 - Assignment Discussion - Week 1
- Lecture 10 - Optical Sources
- Lecture 11 - Semiconductor gain media- structure, spectrum
- Lecture 12 - Optical sources
- Lecture 13 - External Quantum Efficiency
- Lecture 14 - Modulation Bandwidth of LED
- Lecture 15 - Optical and Electrical Bandwidth of LED
- Lecture 16 - Emission Pattern of LED
- Lecture 17 - Optical Sources
- Lecture 18 - Laser Diodes
- Lecture 19 - Laser Diodes
- Lecture 20 - Laser Diodes
- Lecture 21 - Assignment Discussion - Week 2
- Lecture 22 - Laser Diodes
- Lecture 23 - Laser Diodes
- Lecture 24 - Laser rate equation
- Lecture 25 - Laser rate equation
- Lecture 26 - Laser power derivation
- Lecture 27 - Modulation Response of Laser - 1
- Lecture 28 - Modulation Response of Laser - 2
- Lecture 29 - Modulation Response of Laser - 3

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

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- Lecture 30 - Setbacks of direct modulation of laser
- Lecture 31 - Setbacks of direct modulation of laser
- Lecture 32 - Assignment Discussion - Week 3
- Lecture 33 - Recap of direction modulation consequences
- Lecture 34 - Noise in Lasers
- Lecture 35 - Relative Intensity Noise
- Lecture 36 - Laser Phase Noise - 1
- Lecture 37 - Laser Phase Noise - 2
- Lecture 38 - Effect of Laser Phase Noise
- Lecture 39 - Electro-optic phase modulation
- Lecture 40 - Electro-optic intensity modulator
- Lecture 41 - Biasing of MZM
- Lecture 42 - Biasing of MZM
- Lecture 43 - Line coding schemes and their bandwidth requirements
- Lecture 44 - Assignment Discussion - Week 4
- Lecture 45 - Introduction to optical Fiber
- Lecture 46 - Attenuation in optical fibers
- Lecture 47 - Fiber Modes
- Lecture 48 - Modes of a step index fiber - 1
- Lecture 49 - Modes of a step index fiber - 2
- Lecture 50 - Modes of a step index fiber - 3
- Lecture 51 - Modes of a step index fiber - 4
- Lecture 52 - Modes of a step index fiber - 5
- Lecture 53 - Modes and Cut-off conditions
- Lecture 54 - Universal b-V curves
- Lecture 55 - Modal Profiles in step index fiber
- Lecture 56 - Mode Field Diameter
- Lecture 57 - Dispersion- Intermodal dispersion derivation
- Lecture 58 - Dispersion-Bit rate distance Product
- Lecture 59 - Phase Velocity and Group Velocity - 1
- Lecture 60 - Phase Velocity and Group Velocity - 2
- Lecture 61 - Material dispersion
- Lecture 62 - Waveguide dispersion
- Lecture 63 - Total Dispersion in optical fiber
- Lecture 64 - Polarization mode dispersion
- Lecture 65 - Photodetectors concepts
- Lecture 66 - p-n and p-i-n Photodetectors
- Lecture 67 - Avalance Photodetector
- Lecture 68 - Direct detection receiver and sources of noise

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

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- Lecture 69 - Quantifying noises in direct detection receivers
- Lecture 70 - SNR and Operation Regimes
- Lecture 71 - Noise Equivalent power and SNR in APDs
- Lecture 72 - Coherent Receivers
- Lecture 73 - SNR analysis of coherent receivers
- Lecture 74 - Performance Evaluation - 1
- Lecture 75 - Performance Evaluation - 2
- Lecture 76 - Performance Metrics
- Lecture 77 - Performance Metrics
- Lecture 78 - Quantum limit of photodetection
- Lecture 79 - Optical Amplifier
- Lecture 80 - Erbium doped fiber amplifier - 1
- Lecture 81 - Erbium doped fiber amplifier - 2
- Lecture 82 - Erbium doped fiber amplifier - 3
- Lecture 83 - Erbium doped fiber amplifier - 4
- Lecture 84 - Link Design - Rise Time Budget
- Lecture 85 - Link Design - Case Study
- Lecture 86 - Link Design - Passive Optical Network and long haul link
- Lecture 87 - Dispersion - Recap
- Lecture 88 - Dispersion Compensation - Pulse Propagation with dispersion
- Lecture 89 - Pulse propagation - 2
- Lecture 90 - Dispersion Compensation - Dispersion Transfer Function
- Lecture 91 - Dispersion Compensation - Case Study
- Lecture 92 - Dispersion Compensation - WDM and DSP
- Lecture 93 - Nonlinear Effects- Nonlinear refractive Index
- Lecture 94 - Self Phase Modulation
- Lecture 95 - Cross Phase Modulation
- Lecture 96 - Scattering Processes in optical fibers
- Lecture 97 - Stimulated Brillouin Scattering
- Lecture 98 - Stimulated Raman Scattering
- Lecture 99 - Components - Directional Couplers
- Lecture 100 - Components - VOA, Polariser, Polarisation Controllers
- Lecture 101 - Components - Isolator
- Lecture 102 - Components - Circulator, Definitions
- Lecture 103 - Components - Wavelength filters
- Lecture 104 - Components - Arrayed Waveguide Gratings, WSS
- Lecture 105 - Balanced Detection
- Lecture 106 - Polarisation Diverse Coherent Receiver
- Lecture 107 - Phase and Polarisation Diverse Coherent Receiver

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

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- Lecture 108 - Overview of impairments in coherent optical communication
- Lecture 109 - Transceiver impairments - Generation and Compensation
- Lecture 110 - Channel Impairments - Generation and Compensation
- Lecture 111 - Demo video
- Lecture 112 - Introduction to Optical Networks
- Lecture 113 - Layers of Optical Network
- Lecture 114 - SDH/SONET Layering, Frame Structure
- Lecture 115 - Physical Networks Topologies
- Lecture 116 - Topology specific Link Design
- Lecture 117 - Network Protection
- Lecture 118 - Access Networks- PON
- Lecture 119 - Optical Interconnects, Data Centers
- Lecture 120 - Optical communication for Wireless Fronthauling

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

NPTEL Video Course - Electrical Engineering - NOC:Image Signal Processing

Subject Co-ordinator - Prof. A. N. Rajagopalan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Course Introduction  
Lecture 2 - Applications of Image processing  
Lecture 3 - Applications of Image processing (Continued...)  
Lecture 4 - Basics of Images  
Lecture 5 - Shot Noise  
Lecture 6 - Geometric Transformations  
Lecture 7 - Geometric Transformations (Continued...)  
Lecture 8 - Bilinear Interpolation  
Lecture 9 - Geometric Transformations (Continued...)  
Lecture 10 - Projective Transformation  
Lecture 11 - Homography  
Lecture 12 - Homography - Special cases  
Lecture 13 - Computing Homography  
Lecture 14 - RANSAC  
Lecture 15 - Rotational Homography  
Lecture 16 - Research Challenges  
Lecture 17 - Real Aperture Camera  
Lecture 18 - Real aperture camera - Introduction  
Lecture 19 - Circle of confusion  
Lecture 20 - Depth of field, Linearity  
Lecture 21 - Space-Invariance  
Lecture 22 - 2D Convolution  
Lecture 23 - 2D Convolution  
Lecture 24 - Blur Models  
Lecture 25 - Space-variant Blurring  
Lecture 26 - Shape from X - Introduction  
Lecture 27 - 2-View Stereo  
Lecture 28 - Introduction to Shape from Focus  
Lecture 29 - SFF Principle

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

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- Lecture 30 - Shape from focus - Gaussian fitting
- Lecture 31 - Shape from focus - Focus operators
- Lecture 32 - Shape from Focus - Examples
- Lecture 33 - Shape from Focus - Tensor Voting
- Lecture 34 - DFD Principle
- Lecture 35 - Motion Blur
- Lecture 36 - Image Transforms - Introduction
- Lecture 37 - Image Transforms - Motivation
- Lecture 38 - 1D Unitary Transforms - Introduction
- Lecture 39 - Extending 1D Unitary Transform to 2D - Motivation
- Lecture 40 - Extending 1D Unitary Transform to 2D - Example
- Lecture 41 - Alternative Forms of 2D
- Lecture 42 - Kronecker Product
- Lecture 43 - Kronecker Product - (Example Revisited)
- Lecture 44 - Extending 1D Unitary Transform to 2D - Summary
- Lecture 45 - 1D DFT to 2D DFT
- Lecture 46 - 2D DFT Visualization
- Lecture 47 - 2D DFT - Computation
- Lecture 48 - 1D DCT - Definition, Motivation
- Lecture 49 - Relation to DFT
- Lecture 50 - 2D DCT and Walsh-Hadamard Transform
- Lecture 51 - Data Dependent Transforms, Karhunen Loeve Transform
- Lecture 52 - Karhunen-Loeve Transform (KLT) - Concept
- Lecture 53 - Karhunen-Loeve Transform (KLT) - Applications
- Lecture 54 - Karhunen-Loeve Transform (KLT) - Applications
- Lecture 55 - Singular Value Decomposition (SVD)
- Lecture 56 - Applications of SVD
- Lecture 57 - Change detection
- Lecture 58 - Image Thresholding
- Lecture 59 - Adaptive Local thresholding - Motivation
- Lecture 60 - Chow-Kaneko Local thresholding
- Lecture 61 - K-Means Method
- Lecture 62 - ISODATA Method
- Lecture 63 - Theory of Histogram Equalization and Modification
- Lecture 64 - Histogram Equalization example
- Lecture 65 - Image sequence and Single image filtering in Gaussian noise
- Lecture 66 - Non-local Means Method
- Lecture 67 - Non-local Means Filtering (Examples)
- Lecture 68 - Impulse Noise Generator

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

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- Lecture 69 - Impulse noise filtering
- Lecture 70 - Transform Domain Filtering
- Lecture 71 - Illumination Handling
- Lecture 72 - Applications of Restoration, and Image Deblurring
- Lecture 73 - Haddamard's conditions and Least squares solution
- Lecture 74 - Min-norm solution and Norm of Linear operator
- Lecture 75 - Numerical stability analysis
- Lecture 76 - Image Deblurring
- Lecture 77 - Tikhonov-Miller Regularization
- Lecture 78 - Conditional Mean as an Estimator
- Lecture 79 - Linear Estimator
- Lecture 80 - Wiener Filter
- Lecture 81 - Fourier Wiener Filter
- Lecture 82 - 1D Superresolution
- Lecture 83 - Superresolution Examples

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

NPTEL Video Course - Electrical Engineering - NOC:Fundamentals of Electric Vehicles: Technology and Economics

Subject Co-ordinator - Prof. Ashok Jhunjunwala, Prof. Prabhjot Kaur, Prof. Kaushal Kumar Jha, Prof. L Kannan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Overview of Electric Vehicles in India
- Lecture 2 - Can India Drive its EV program Innovatively and Differently and scale? - Part 1
- Lecture 3 - Can India Drive its EV program Innovatively and Differently and scale? - Part 2
- Lecture 4 - A bit about batteries
- Lecture 5 - Charging and Swapping Infrastructure
- Lecture 6 - Where will we get Lithium for batteries?
- Lecture 7 - EV Subsystems
- Lecture 8 - Forces acting when a vehicle move
- Lecture 9 - Aerodynamic drag, Rolling Resistance and Uphill Resistance
- Lecture 10 - Power and Torque to accelerate
- Lecture 11 - Putting it all together - 1
- Lecture 12 - Putting it all together - 2
- Lecture 13 - Concept of Drive Cycle - 1
- Lecture 14 - Concept of Drive Cycle - 2
- Lecture 15 - Drive Cycles and Energy used per km - Part 1
- Lecture 16 - Drive Cycles and Energy used per km - Part 2
- Lecture 17 - EV Subsystem
- Lecture 18 - EV Subsystem
- Lecture 19 - Introduction to Battery Parameters - Part 1
- Lecture 20 - Introduction to Battery Parameters - Part 2
- Lecture 21 - Why Lithium Ion Battery? - Part 1
- Lecture 22 - Why Lithium Ion Battery? - Part 2
- Lecture 23 - Batteries in Future
- Lecture 24 - Li-Ion Battery Cells
- Lecture 25 - SoH and SoC estimation and Self Discharge - Part 1
- Lecture 26 - SoH and SoC estimation and Self Discharge - Part 2
- Lecture 27 - Battery Pack Development - Part 1
- Lecture 28 - Battery Pack Development - Part 2
- Lecture 29 - Computation of Effective cost of battery - Part 1

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

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- Lecture 30 - Computation of Effective cost of battery - Part 2
- Lecture 31 - Charging Batteries
- Lecture 32 - Fundamentals of Battery Pack Design
- Lecture 33 - Mechanical Design - Part 1
- Lecture 34 - Mechanical Design - Part 2
- Lecture 35 - Mechanical Design - Part 3
- Lecture 36 - Mechanical Design - Part 4
- Lecture 37 - Thermal Design - Part 1
- Lecture 38 - Thermal Design - Part 2
- Lecture 39 - Thermal Design - Part 3
- Lecture 40 - Thermal Design - Part 4
- Lecture 41 - Electrical Design - Part 1
- Lecture 42 - Electrical Design - Part 2
- Lecture 43 - Electrical Design - Part 3
- Lecture 44 - BMS Design of Electric Vehicle - Part 1
- Lecture 45 - BMS Design of Electric Vehicle - Part 2
- Lecture 46 - BMS Design of Electric Vehicle - Part 3
- Lecture 47 - EV Motors and Controllers - Understanding Flow - Part 1
- Lecture 48 - EV Motors and Controllers - Understanding Flow - Part 2
- Lecture 49 - Power and Efficiency
- Lecture 50 - Torque Production - Part 1
- Lecture 51 - Torque Production - Part 2
- Lecture 52 - Torque Production - Part 3
- Lecture 53 - Speed and Back EMF
- Lecture 54 - The d-q Equivalent circuit - Part 1
- Lecture 55 - The d-q Equivalent circuit - Part 2
- Lecture 56 - Field-oriented Control
- Lecture 57 - Three phase AC - Part 1
- Lecture 58 - Three phase AC - Part 2
- Lecture 59 - Thermal Design - Part 1
- Lecture 60 - Thermal Design - Part 2
- Lecture 61 - Engineering Considerations - Part 1
- Lecture 62 - Engineering Considerations - Part 2
- Lecture 63 - Future Frontiers
- Lecture 64 - EV Chargers
- Lecture 65 - EV Chargers
- Lecture 66 - EV Chargers
- Lecture 67 - Battery Swapping
- Lecture 68 - Standardization and On board Chargers

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

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- Lecture 69 - Public Chargers - Part 1
- Lecture 70 - Public Chargers - Part 2
- Lecture 71 - Bulk Chargers/Swap Stations - Part 1
- Lecture 72 - Bulk Chargers/Swap Stations - Part 2
- Lecture 73 - Economics of Public Chargers in context
- Lecture 74 - Analytics - Part 1
- Lecture 75 - Analytics - Part 2
- Lecture 76 - Course Summary

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

NPTEL Video Course - Electrical Engineering - NOC:Applied Linear Algebra

Subject Co-ordinator - Prof. Andrew Thangaraj

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to the Course
- Lecture 2 - Vector Spaces
- Lecture 3 - Linear Combinations and Span
- Lecture 4 - Subspaces, Linear Dependence and Independence
- Lecture 5 - Basis and Dimension
- Lecture 6 - Sums, Direct Sums and Gaussian Elimination
- Lecture 7 - Linear Maps and Matrices
- Lecture 8 - Null space, Range, Fundamental theorem of linear maps
- Lecture 9 - Column space, null space and rank of a matrix
- Lecture 10 - Algebraic operations on linear maps
- Lecture 11 - Invertible maps, Isomorphism, Operators
- Lecture 12 - Solving Linear Equations
- Lecture 13 - Elementary Row Operations
- Lecture 14 - Translates of a subspace, Quotient Spaces
- Lecture 15 - Row space and rank of a matrix
- Lecture 16 - Determinants
- Lecture 17 - Coordinates and linear maps under a change of basis
- Lecture 18 - Simplifying matrices of linear maps by choice of basis
- Lecture 19 - Polynomials and Roots
- Lecture 20 - Invariant subspaces, Eigenvalues, Eigenvectors
- Lecture 21 - More on Eigenvalues, Eigenvectors, Diagonalization
- Lecture 22 - Eigenvalues, Eigenvectors and Upper Triangularization
- Lecture 23 - Properties of Eigenvalues
- Lecture 24 - Linear state space equations and system stability
- Lecture 25 - Discrete-time Linear Systems and Discrete Fourier Transforms
- Lecture 26 - Sequences and counting paths in graphs
- Lecture 27 - PageRank Algorithm
- Lecture 28 - Dot product and length in  $C^n$ , Inner product and norm in  $V$  over  $F$
- Lecture 29 - Orthonormal basis and Gram-Schmidt orthogonalisation

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

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- Lecture 30 - Linear Functionals, Orthogonal Complements
- Lecture 31 - Orthogonal Projection
- Lecture 32 - Projection and distance from a subspace
- Lecture 33 - Linear equations, Least squares solutions and Linear regression
- Lecture 34 - Minimum Mean Squared Error Estimation
- Lecture 35 - Adjoint of a linear map
- Lecture 36 - Properties of Adjoint of a Linear Map
- Lecture 37 - Adjoint of an Operator and Operator-Adjoint Product
- Lecture 38 - Self-adjoint Operator
- Lecture 39 - Normal Operators
- Lecture 40 - Complex Spectral Theorem
- Lecture 41 - Real Spectral Theorem
- Lecture 42 - Positive Operators
- Lecture 43 - Quadratic Forms, Matrix Norms and Optimization
- Lecture 44 - Isometries
- Lecture 45 - Classification of Operators
- Lecture 46 - Singular Values and Vectors of a Linear Map
- Lecture 47 - Singular Value Decomposition
- Lecture 48 - Polar decomposition and some applications of SVD

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

NPTEL Video Course - Electrical Engineering - NOC:Basic Electrical Circuits

Subject Co-ordinator - Dr. Nagendra Krishnapura

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Preliminaries
- Lecture 2 - Current
- Lecture 3 - Voltage
- Lecture 4 - Electrical elements and circuits
- Lecture 5 - Kirchhoff's current law (KCL)
- Lecture 6 - Kirchhoff's voltage law (KVL)
- Lecture 7 - Voltage source
- Lecture 8 - Current source
- Lecture 9 - Resistor
- Lecture 10 - Capacitor
- Lecture 11 - Inductor
- Lecture 12 - Mutual inductor
- Lecture 13 - Linearity of elements
- Lecture 14 - Series connection-Voltage sources in series
- Lecture 15 - Series connection of R, L, C, current source
- Lecture 16 - Elements in parallel
- Lecture 17 - Current source in series with an element; Voltage source in parallel with an element
- Lecture 18 - Extreme cases
- Lecture 19 - Summary
- Lecture 20 - Voltage controlled voltage source (VCVS)
- Lecture 21 - Voltage controlled current source (VCCS)
- Lecture 22 - Current controlled voltage source (CCVS)
- Lecture 23 - Current controlled current source (CCCS)
- Lecture 24 - Realizing a resistance using a VCCS or CCCS
- Lecture 25 - Scaling an element's value using controlled sources
- Lecture 26 - Example calculation
- Lecture 27 - Power and energy absorbed by electrical elements
- Lecture 28 - Power and energy in a resistor
- Lecture 29 - Power and energy in a capacitor

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

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- Lecture 30 - Power and energy in an inductor
- Lecture 31 - Power and energy in a voltage source
- Lecture 32 - Power and energy in a current source
- Lecture 33 - Goals of circuit analysis
- Lecture 34 - Number of independent KCL equations
- Lecture 35 - Number of independent KVL equations and branch relationships
- Lecture 36 - Analysis of circuits with a single independent source
- Lecture 37 - Analysis of circuits with multiple independent sources using superposition
- Lecture 38 - Superposition
- Lecture 39 - What is nodal analysis
- Lecture 40 - Setting up nodal analysis equations
- Lecture 41 - Structure of the conductance matrix
- Lecture 42 - How do elements circuit appear in the nodal analysis formulation
- Lecture 43 - Completely solving the circuit starting from nodal analysis
- Lecture 44 - Nodal analysis example
- Lecture 45 - Matrix inversion basics
- Lecture 46 - Nodal analysis with independent voltage sources
- Lecture 47 - Supernode for nodal analysis with independent voltage sources
- Lecture 48 - Nodal analysis with VCCS
- Lecture 49 - Nodal analysis with VCVS
- Lecture 50 - Nodal analysis with CCCS
- Lecture 51 - Nodal analysis with CVCVS
- Lecture 52 - Nodal analysis summary
- Lecture 53 - Planar circuits
- Lecture 54 - Mesh currents and their relationship to branch currents
- Lecture 55 - Mesh analysis
- Lecture 56 - Mesh analysis with independent current sources-Supermesh
- Lecture 57 - Mesh analysis with current controlled voltage sources
- Lecture 58 - Mesh analysis with current controlled current sources
- Lecture 59 - Mesh analysis using voltage controlled sources
- Lecture 60 - Nodal analysis versus Mesh analysis
- Lecture 61 - Superposition theorem
- Lecture 62 - Pushing a voltage source through a node
- Lecture 63 - Splitting a current source
- Lecture 64 - Substitution theorem
- Lecture 65 - Substitution theorem
- Lecture 66 - Substituting a voltage or current source with a resistor
- Lecture 67 - Extensions to Superposition and Substitution theorem
- Lecture 68 - Thevenin's theorem

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

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- Lecture 69 - Worked out example
- Lecture 70 - Norton's theorem
- Lecture 71 - Worked out example
- Lecture 72 - Maximum power transfer theorem
- Lecture 73 - Preliminaries
- Lecture 74 - Two port parameters
- Lecture 75 - y parameters
- Lecture 76 - y parameters
- Lecture 77 - z parameters
- Lecture 78 - z parameters
- Lecture 79 - h parameters
- Lecture 80 - h parameters
- Lecture 81 - g parameters
- Lecture 82 - g parameters
- Lecture 83 - Calculations with a two-port element
- Lecture 84 - Calculations with a two-port element
- Lecture 85 - Degenerate cases
- Lecture 86 - Relationships between different two-port parameters
- Lecture 87 - Equivalent circuit representation of two-ports
- Lecture 88 - Reciprocity
- Lecture 89 - Proof of reciprocity of resistive two-ports
- Lecture 90 - Proof for 4-terminal two-ports
- Lecture 91 - Reciprocity in terms of different two-port parameters
- Lecture 92 - Reciprocity in circuits containing controlled sources
- Lecture 93 - Examples
- Lecture 94 - Feedback amplifier using an opamp
- Lecture 95 - Ideal opamp
- Lecture 96 - Negative feedback around the opamp
- Lecture 97 - Finding opamp sign for negative feedback
- Lecture 98 - Example
- Lecture 99 - Analysis of circuits with opamps
- Lecture 100 - More on opamps
- Lecture 101 - Inverting amplifier
- Lecture 102 - Summing amplifier
- Lecture 103 - Instrumentation amplifier
- Lecture 104 - Negative resistance
- Lecture 105 - Finding opamp signs for negative feedback-circuits with multiple opamps
- Lecture 106 - Opamp supply voltages and saturation
- Lecture 107 - KCL with an opamp and supply currents

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

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- Lecture 108 - Circuits with storage elements (capacitors and inductors)
- Lecture 109 - First order circuit with zero input-natural response
- Lecture 110 - First order RC circuit with zero input-Example
- Lecture 111 - First order circuit with a constant input
- Lecture 112 - General form of the first order circuit response
- Lecture 113 - First order RC circuit with a constant input-Example
- Lecture 114 - First order circuit with piecewise constant input
- Lecture 115 - First order circuit with piecewise constant input-Example
- Lecture 116 - First order circuit-Response of arbitrary circuit variables
- Lecture 117 - Summary
- Lecture 118 - Does a capacitor block DC?
- Lecture 119 - Finding the order of a circuit
- Lecture 120 - First order RC circuits with discontinuous capacitor voltages
- Lecture 121 - Summary
- Lecture 122 - First order RL circuits
- Lecture 123 - First order RL circuit with discontinuous inductor current-Example
- Lecture 124 - First order RC circuit with an exponential input
- Lecture 125 - First order RC response to its own natural response
- Lecture 126 - First order RC response to a sinusoidal input
- Lecture 127 - First order RC response to a sinusoidal input-via the complex exponential
- Lecture 128 - Summary
- Lecture 129 - Three methods of calculating the sinusoidal steady state response
- Lecture 130 - Calculating the total response including initial conditions
- Lecture 131 - Why are sinusoids used in measurement?
- Lecture 132 - Second order system natural response
- Lecture 133 - Second order system as a cascade of two first order systems
- Lecture 134 - Second order system natural response-critically damped and underdamped
- Lecture 135 - Generalized form of a second order system
- Lecture 136 - Numerical example
- Lecture 137 - Series and parallel RLC circuits
- Lecture 138 - Forced response of a second order system
- Lecture 139 - Steady state response calculation and Phasors
- Lecture 140 - Phasors (Continued...)
- Lecture 141 - Magnitude and Phase plots
- Lecture 142 - Magnitude and phase plots of a second order system
- Lecture 143 - Maximum power transfer and Conjugate matching

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

NPTEL Video Course - Electrical Engineering - NOC:Optical Fiber Sensors

Subject Co-ordinator - Prof. Balaji Srinivasan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to optical sensors  
Lecture 2 - Different types of optical sensors  
Lecture 3 - Overview of distributed sensors  
Lecture 4 - Optical sensors system  
Lecture 5 - Optical sources  
Lecture 6 - Optical receivers - 1  
Lecture 7 - Optical receivers - 2  
Lecture 8 - Optical receivers - 3  
Lecture 9 - Optical receiver design  
Lecture 10 - Noise Analysis  
Lecture 11 - Sensor Performance characteristics  
Lecture 12 - Noise Mitigation Techniques  
Lecture 13 - Lock in detection  
Lecture 14 - Amplitude modulated sensors - 1  
Lecture 15 - Gas absorption spectroscopy  
Lecture 16 - Amplitude modulated sensors - 2  
Lecture 17 - Amplitude modulated sensors - 3  
Lecture 18 - Amplitude modulated sensors - 4  
Lecture 19 - Problem Discussion  
Lecture 20 - Pulse-oximeter  
Lecture 21 - Phase modulated sensors - 1  
Lecture 22 - Phase modulated sensors - 2  
Lecture 23 - Phase modulated Sensors - 3  
Lecture 24 - Phase modulated sensors - 4  
Lecture 25 - Phase modulated sensors - 5  
Lecture 26 - Phase modulated sensors - 6  
Lecture 27 - Phase modulated sensors - 7  
Lecture 28 - Phase modulated sensors - 8  
Lecture 29 - Phase modulated sensors - 9

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

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- Lecture 30 - Phase modulated sensors - 10
- Lecture 31 - Phase modulated Sensors - 11
- Lecture 32 - Wavelength modulated sensors - 1
- Lecture 33 - Wavelength modulated sensors - 2
- Lecture 34 - Wavelength modulated sensors - 3
- Lecture 35 - Wavelength modulated sensors - 4
- Lecture 36 - Wavelength modulated sensors - 5
- Lecture 37 - Wavelength modulated sensors - 6
- Lecture 38 - Wavelength modulated sensors - 7
- Lecture 39 - Wavelength modulated sensors - 8
- Lecture 40 - Polarization modulated sensors - 1
- Lecture 41 - Polarization modulated sensors - 2
- Lecture 42 - Polarization modulated sensors - 3

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

NPTEL Video Course - Electrical Engineering - NOC:Introduction to Time - Varying Electrical Networks

Subject Co-ordinator - Prof. Shanthi Pavan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Course Introduction and Motivation
- Lecture 2 - Kirchoff's Current and Voltage Laws, and the Incidence Matrix
- Lecture 3 - Power Conservation and Tellegen's Theorem
- Lecture 4 - Intuition behind Tellegen's Theorem
- Lecture 5 - Tellegen's Theorem and reciprocity in linear resistive networks
- Lecture 6 - Why is reciprocity useful in practice?
- Lecture 7 - Inter-reciprocity in linear time-invariant networks
- Lecture 8 - Inter-reciprocity in linear time-invariant networks (Continued...)
- Lecture 9 - Inter-reciprocity in networks with ideal operational amplifiers
- Lecture 10 - Review of Modified Nodal Analysis (MNA) of linear networks
- Lecture 11 - MNA stamps of controlled sources - the VCCS and VCVS
- Lecture 12 - MNA stamps of controlled sources - the CCCS and C CVS
- Lecture 13 - Inter-reciprocity in linear networks - using the MNA stamp approach
- Lecture 14 - The Adjoint Network
- Lecture 15 - MNA stamp of an ideal opamp
- Lecture 16 - Properties of circuits with multiple ideal opamps
- Lecture 17 - Introduction to noise in electrical networks
- Lecture 18 - Noise processed by a linear time-invariant system
- Lecture 19 -  $kT/C$  noise in a sample-and-hold circuit
- Lecture 20 - Noise in RLC networks
- Lecture 21 - Total integrated noise in RLC Networks
- Lecture 22 - Bode's Noise Theorem - Frequency domain
- Lecture 23 - Input referred noise in electrical networks - Part 1
- Lecture 24 - Input referred noise in electrical networks - Part 2
- Lecture 25 - Input referred noise and the noise factor
- Lecture 26 - Noise Factor Examples
- Lecture 27 - Motivation to learn about time-varying circuits and systems - Part 1
- Lecture 28 - Motivation to learn about time-varying circuits and systems - Part 2
- Lecture 29 - Convolution integral for LTV systems

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

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- Lecture 30 - Frequency response of an LTV system
- Lecture 31 - LTV system example : Time-varying RC filter
- Lecture 32 - Linear Periodically Time-Varying Systems (LPTV)
- Lecture 33 - Response of an LPTV system to a complex exponential input
- Lecture 34 - Harmonic Transfer Functions
- Lecture 35 - Zadeh expansion of an LPTV system
- Lecture 36 - MNA analysis of LPTV networks
- Lecture 37 - MNA stamp of a periodically time varying conductance
- Lecture 38 - MNA stamp of a capacitor and a voltage source in an LPTV network
- Lecture 39 - Analysis of an example LPTV network - Part 1
- Lecture 40 - Analysis of an example LPTV network - Part 2
- Lecture 41 - LPTV network analysis, RC filter, time-varying
- Lecture 42 - Impedance and admittance in LTI and LPTV networks
- Lecture 43 - Thevenin and Norton's Theorems for LPTV networks
- Lecture 44 - The N-path principle
- Lecture 45 - N-path example
- Lecture 46 - Time-domain intuition of the N-path principle
- Lecture 47 - N-path example: Time-Interleaved ADCs
- Lecture 48 - Dc-dc converter as an LPTV system
- Lecture 49 - N-path principle: Multiphase dc-dc converter
- Lecture 50 - The N-path filter
- Lecture 51 - Computing  $H_0(j2\pi f_s)$  for a 4-path filter
- Lecture 52 - Input impedance of the 4-path filter at  $f_s$
- Lecture 53 - Computing  $H_0(j2\pi 2 f_s)$  for a 4-path filter
- Lecture 54 - Determining  $H_0$  for input frequency deviations from  $f_s$
- Lecture 55 - Reciprocity and Inter-reciprocity in LPTV networks : Part 1
- Lecture 56 - Reciprocity and Inter-reciprocity in LPTV networks : Part 2, the transfer-function theorem
- Lecture 57 - Why is the transfer-function theorem important?
- Lecture 58 - The frequency-reversal theorem for inter-reciprocal (adjoint) LPTV networks : introduction
- Lecture 59 - The frequency-reversal theorem for inter-reciprocal (adjoint) LPTV networks : derivation
- Lecture 60 - Why is the frequency-reversal theorem important?
- Lecture 61 - Inter-reciprocity in signal-flow graphs
- Lecture 62 - Applications of inter-reciprocity: analysis of chopped amplifiers
- Lecture 63 - Applications of inter-reciprocity: analysis of chopped amplifiers (Continued...)
- Lecture 64 - Applications of inter-reciprocity: chopping with square-wave modulation
- Lecture 65 - Applications of inter-reciprocity: the switched-RC network
- Lecture 66 - Time-domain implications of inter-reciprocity and the adjoint network
- Lecture 67 - Time-domain implications of inter-reciprocity and the adjoint network : Example calculation
- Lecture 68 - LPTV networks with sampled outputs: Switched capacitor circuits

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

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- Lecture 69 - LPTV networks with sampled outputs: A continuous-time delta-sigma data converter
- Lecture 70 - LPTV networks with sampled outputs: The equivalent LTI filter
- Lecture 71 - Finding the equivalent LTI filter of a sampled LPTV system : example
- Lecture 72 - Equivalent LTI filter for a switched-RC network
- Lecture 73 - Finding the equivalent LTI filter of a sampled LPTV system : example of a continuous-time delta-
- Lecture 74 - Finding the equivalent LTI filter of a sampled LPTV system with offset sampling
- Lecture 75 - LPTV networks driven by modulated inputs
- Lecture 76 - Introduction to noise in LPTV Networks
- Lecture 77 - Noise in LPTV networks with sampled outputs
- Lecture 78 - Total integrated noise in networks with R,L,C and periodically operated switches

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

NPTEL Video Course - Electrical Engineering - NOC:Digital System Design

Subject Co-ordinator - Prof. Neeraj Goel

Co-ordinating Institute - IIT - Ropar

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

Lecture 1 - Introduction  
Lecture 2 - Analog vs Digital  
Lecture 3 - Binary number system - 1  
Lecture 4 - Binary number system - 2  
Lecture 5 - Negative number representation - 1  
Lecture 6 - Negative number representation - 2  
Lecture 7 - Other number systems  
Lecture 8 - Floating point numbers - 1  
Lecture 9 - Floating point numbers - 2  
Lecture 10 - Floating point numbers - 3  
Lecture 11 - Floating point numbers - 4  
Lecture 12 - Floating point numbers - 5  
Lecture 13 - Boolean functions  
Lecture 14 - Boolean Algebra  
Lecture 15 - SOP and POS Representation  
Lecture 16 - Algebraic simplifications  
Lecture 17 - Canonical form  
Lecture 18 - Boolean minimization using K-Maps  
Lecture 19 - More Logic gates  
Lecture 20 - Hardware description language:Verilog  
Lecture 21 - Verilog simulation demo  
Lecture 22 - K-maps  
Lecture 23 - QM-method  
Lecture 24 - Area delay model  
Lecture 25 - Multi-level logic  
Lecture 26 - Multiplexer  
Lecture 27 - Four state logic  
Lecture 28 - Decoders - 1  
Lecture 29 - Decoders - 2

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

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Lecture 30 - Encoders  
Lecture 31 - Programmable hardware  
Lecture 32 - Ripple carry adder  
Lecture 33 - Carry look ahead adder  
Lecture 34 - Modeling BUS in Verilog  
Lecture 35 - Fast adder:Carry select adder  
Lecture 36 - Multiple operand adder  
Lecture 37 - Multiplication  
Lecture 38 - Iterative circuits - 1  
Lecture 39 - Iterative circuits - 2  
Lecture 40 - Introduction to sequential circuits  
Lecture 41 - Latches  
Lecture 42 - D-Flip-flops  
Lecture 43 - More Flip-flops  
Lecture 44 - Counters  
Lecture 45 - Verilog-Behavior model - 1  
Lecture 46 - Verilog-Behavior model - 2  
Lecture 47 - Registers - 1  
Lecture 48 - Registers - 2  
Lecture 49 - Memory  
Lecture 50 - Sequential circuit analysis  
Lecture 51 - Derivation state graph  
Lecture 52 - Sequence detector: Example 1  
Lecture 53 - Sequence detector: Example 2  
Lecture 54 - State machine reduction  
Lecture 55 - State encoding  
Lecture 56 - Multi-cycle adder design  
Lecture 57 - Pipelined adder design  
Lecture 58 - Multiplication design  
Lecture 59 - Division hardware design  
Lecture 60 - Interacting state machines  
Lecture 61 - Register Transfer Level design  
Lecture 62 - GCD computer at RTL Level  
Lecture 63 - RTL Design - Bubble sort  
Lecture 64 - RTL Design - Traffic light controller  
Lecture 65 - FPGA  
Lecture 66 - Xilinx CLB  
Lecture 67 - FPGA - Design flow  
Lecture 68 - FPGA design demo

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

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- Lecture 69 - Introduction to ASIC design flow - Part 1
- Lecture 70 - Introduction to ASIC design flow - Part 2
- Lecture 71 - Future directions

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

NPTEL Video Course - Electrical Engineering - NOC:Stochastic Modeling and the Theory of Queues

Subject Co-ordinator - Prof. Krishna Jagannathan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Review of Probability Theory: Random Variable
- Lecture 2 - Sequence of Random Variables
- Lecture 3 - Laws of Large Numbers and Central Limit Theorem
- Lecture 4 - What is a stochastic process?
- Lecture 5 - Counting Process
- Lecture 6 - Poisson Process - Introduction
- Lecture 7 - Poisson Process - Memorylessness
- Lecture 8 - Poisson Process - Increment properties
- Lecture 9 - Distribution of arrival epoch  $S_n$  and  $N(t)$  for a Poisson Process
- Lecture 10 - Alternate definitions of a Poisson Process
- Lecture 11 - Merging of Poisson Processes - Part 1
- Lecture 12 - Merging of Poisson Processes - Part 2
- Lecture 13 - Splitting of Poisson Process - Part 1
- Lecture 14 - Splitting of Poisson Process - Part 2
- Lecture 15 - Example: Poisson Splitting
- Lecture 16 - Conditional arrival density and order statistics - Part 1
- Lecture 17 - Conditional arrival density and order statistics - Part 2
- Lecture 18 - Non Homogeneous Poisson Process
- Lecture 19 - Introduction to Queueing (with examples)
- Lecture 20 - Examples: Non homogeneous Poisson process
- Lecture 21 - Examples: Competing Poisson processes
- Lecture 22 - Introduction to Renewal Processes
- Lecture 23 - Strong law for renewal processes
- Lecture 24 - Strong law for renewal processes - Proof
- Lecture 25 - Residual life, age and duration (Time average) - Part 1
- Lecture 26 - Residual life, age and duration (Time average) - Part 2
- Lecture 27 - Renewal Reward Theorem (Time average) - Part 1
- Lecture 28 - Renewal Reward Theorem (Time average) - Part 2
- Lecture 29 - Stopping time

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

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- Lecture 30 - Wald's Equality
- Lecture 31 - Wald's Equality (Continued...)
- Lecture 32 - Elementary Renewal Theorem
- Lecture 33 - The Renewal Equation
- Lecture 34 - The Renewal Equation (Continued...)
- Lecture 35 - G/G/1 Queue and Little's theorem
- Lecture 36 - Little's theorem
- Lecture 37 - M/G/1 Queue
- Lecture 38 - M/G/1 Queue and PK Formula
- Lecture 39 - M/G/1 Queue and PK Formula (Continued...)
- Lecture 40 - Ensemble rewards - Age and Duration
- Lecture 41 - Ensemble rewards - Age and Duration (Continued...)
- Lecture 42 - Key Renewal Theorem and Ensemble rewards
- Lecture 43 - Introduction to finite state Discrete Time Markov Chains
- Lecture 44 - Class and Types of Classes in a DTMC
- Lecture 45 - Periodicity in a DTMC
- Lecture 46 - Matrix Representation of a DTMC
- Lecture 47 - The long term behaviour of a DTMC
- Lecture 48 - Stationary Distribution and Long term behaviour of a DTMC - Part 1
- Lecture 49 - Stationary Distribution and Long term behaviour of a DTMC - Part 2
- Lecture 50 - Stationary Distribution and Long term behaviour of a DTMC - Part 3
- Lecture 51 - Spectral Properties of Stochastic Matrices - Part 1
- Lecture 52 - Spectral Properties of Stochastic Matrices - Part 2
- Lecture 53 - The Short-term Behaviour of a DTMC
- Lecture 54 - Introduction to Countable-state DTMC
- Lecture 55 - Introduction to Countable-state DTMC (Continued...)
- Lecture 56 - The Strong Markov Property
- Lecture 57 - Renewal Theory applied to DTMC's
- Lecture 58 - Stationary Distribution of a Countable State Space DTMC and Renewal Theory
- Lecture 59 - Stationary Distribution of a Countable State Space DTMC and Renewal Theory (Continued...)
- Lecture 60 - Stationary Distribution and The Steady State Behaviour of a Countable-state DTMC - Part 1
- Lecture 61 - Stationary Distribution and The Steady State Behaviour of a Countable-state DTMC - Part 2
- Lecture 62 - Convergence to Steady State of a Countable-state DTMC (Stochastic Coupling)
- Lecture 63 - The Birth-Death Markov Chains
- Lecture 64 - The Reversibility Markov Chains
- Lecture 65 - The Reversibility Markov Chains (Continued...)
- Lecture 66 - Time Sampled M/M/1 Queue and The Burke's Theorem
- Lecture 67 - Introduction to Continuous Time Markov Chains
- Lecture 68 - Introduction to CTMC (Continued...)

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

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- Lecture 69 - The Steady State Behaviour of CTMC - Part 1
- Lecture 70 - The Steady State Behaviour of CTMC - Part 2
- Lecture 71 - The Steady State Behaviour of CTMC - Part 3
- Lecture 72 - The Steady State Behaviour of CTMC - Part 4
- Lecture 73 - The chapman-kolmogrov equations for CTMC's
- Lecture 74 - The Birth-Death Continuous time Markov Chains
- Lecture 75 - The Reversibility of Continuous time Markov Chains
- Lecture 76 - Burke's Theorem and the Tandem Queues - Part 1
- Lecture 77 - Burke's Theorem and the Tandem Queues - Part 2
- Lecture 78 - The Jackson Networks - Part 1
- Lecture 79 - The Jackson Networks - Part 2
- Lecture 80 - Semi Markov Processes - Part 1
- Lecture 81 - Semi Markov Processes - Part 2

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

NPTEL Video Course - Electrical Engineering - NOC: Integrated Photonics Devices and Circuits

Subject Co-ordinator - Prof. Bijoy Krishna Das

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Course Background and Learning Outcome
- Lecture 2 - Moore's Law and Interconnect Bottleneck
- Lecture 3 - Progress in Optical Interconnect Technology and Beyond
- Lecture 4 - Evolution of Silicon Photonics Platform
- Lecture 5 - Fundamentals of Lightwaves: EM Waves: Maxwell Equations and Plane Wave Solutions
- Lecture 6 - Fundamentals of Lightwaves: EM Waves: Wave Propagation in Lossy Dielectric Medium
- Lecture 7 - Fundamentals of Lightwaves: EM Waves in Metals and Semiconductors
- Lecture 8 - Fundamentals of Lightwaves: EM Waves: Plasma Dispersion
- Lecture 9 - Fundamentals of Lightwaves: EM Waves Principle of Optical Waveguiding
- Lecture 10 - Fundamentals of Lightwaves: 1-D Optical Waveguide: Ray Optics Model
- Lecture 11 - Optical Waveguides: Theory and Design: TIR Based Eigen Mode Solutions for Slab Waveguides
- Lecture 12 - Optical Waveguides: Theory and Design: TIR Based Design Solutions for Slab Waveguides
- Lecture 13 - Optical Waveguides: Theory and Design: Guided Mode Solutions for Slab Waveguides
- Lecture 14 - Optical Waveguides: Theory and Design: Guided Mode Solutions for Slab Waveguides cont
- Lecture 15 - Optical Waveguides: Theory and Design: Guided Mode Dispersion and Power in Slab Waveguides
- Lecture 16 - Optical Waveguides: Theory and Design: Optical Waveguide with 2D confinement
- Lecture 17 - Optical Waveguides: Theory and Design: Dispersion and Polarization of Guided Modes
- Lecture 18 - Optical Waveguides: Theory and Design: Orthogonality of Guided Modes
- Lecture 19 - Optical Waveguides: Theory and Design: Coupled Mode Theory of Guided Modes
- Lecture 20 - Optical Waveguides: Theory and Design: Coupled Mode Theory (Continued...)
- Lecture 21 - Optical Waveguides: Theory and Design: Coupled Mode Theory (Continued...)
- Lecture 22 - Integrated Optical Components: Y-Junction Power Splitter/Combiner and Mach-Zehnder Interferometer
- Lecture 23 - Integrated Optical Components: Directional Coupler: Coupled Waveguides
- Lecture 24 - Integrated Optical Components: Directional Coupler: Coupled Waveguides (Continued...)
- Lecture 25 - Integrated Optical Components: Directional Coupler: Design and Modelling
- Lecture 26 - Integrated Optical Components: DC based MZI and Microring Resonator (MRR)
- Lecture 27 - Integrated Optical Components: Microring Resonator (MRR): Passive Characteristics
- Lecture 28 - Integrated Optical Components: Distributed Bragg Reflector (DBR)
- Lecture 29 - Integrated Optical Components: Distributed Bragg Reflector (DBR): Device Design - Part 1

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

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- Lecture 30 - Integrated Optical Components: Distributed Bragg Reflector (DBR): Device Design - Part 2
- Lecture 31 - Tunable Devices and Reconfigurable Circuits: Phase Error Interference
- Lecture 32 - Tunable Devices and Reconfigurable Circuits: Post Fabrication Phase Error Corrections
- Lecture 33 - Tunable Devices and Reconfigurable Circuits: Thermo-Optic Switching and Tuning
- Lecture 34 - Tunable Devices and Reconfigurable Circuits: Programmable Silicon Photonics
- Lecture 35 - Electro-Optic Modulators for Integrated Photonics: Basic Design and Working Principle
- Lecture 36 - Electro-Optic Modulators for Integrated Photonics: Various Physical Mechanisms
- Lecture 37 - Electro-Optic Modulators for Integrated Photonics: FCCE Based Silicon Photonics Modulator
- Lecture 38 - Light Sources and Photodetectors for Integrated Photonics: Integrated Photonic light Sources - P
- Lecture 39 - Light Sources and Photodetectors for Integrated Photonics: Integrated Photonic light Sources - P
- Lecture 40 - Light Sources and Photodetectors for Integrated Photonics: Photodetectors for Silicon Photonics

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

NPTEL Video Course - Electrical Engineering - NOC:Introduction to Semiconductor Devices

Subject Co-ordinator - Prof. Naresh Kumar Emani

Co-ordinating Institute - IIT - Hyderabad

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

- Lecture 1 - Types of Semiconductors
- Lecture 2 - Classical Vs Quantum Mechanics
- Lecture 3 - Electrons in infinite and finite 1D potential well
- Lecture 4 - 3D potential well model of atom and Bohr's model
- Lecture 5 - Covalent bonds and inter-atomic interactions in Silicon
- Lecture 6 - Energy band formation
- Lecture 7 - Electron hole pair generation
- Lecture 8 - Direct and Indirect bandgap semiconductors
- Lecture 9 - Energy levels in infinite and finite potential wells (short demo)
- Lecture 10 - Effective mass in Semiconductors
- Lecture 11 - Intrinsic carrier density
- Lecture 12 - Doping and extrinsic semiconductors
- Lecture 13 - Fermi level in extrinsic semiconductors
- Lecture 14 - Temperature dependence of Fermi level
- Lecture 15 - Temperature dependence of Fermi level
- Lecture 16 - Charge neutrality relationship
- Lecture 17 - Drift current and energy band representation of kinetic energy of carriers
- Lecture 18 - Semiconductor bands in a electric field
- Lecture 19 - Diffusion current
- Lecture 20 - Non-uniform doping
- Lecture 21 - Equilibrium Vs Nonequilibrium carrier response
- Lecture 22 - Minority carrier diffusion equation (MCDE) - Example problems
- Lecture 23 - Quasi Fermi level in nonequilibrium conditions
- Lecture 24 - Quasi Fermi level and minority carrier diffusion length
- Lecture 25 - Semiconductor device fabrication
- Lecture 26 - PN Junctions - An introduction
- Lecture 27 - PN Junction electrostatics
- Lecture 28 - Energy band diagram of PN junction
- Lecture 29 - Depletion width and peak electric field

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

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- Lecture 30 - PN junction electrostatics - examples
- Lecture 31 - Demo of PN Junction Lab on Nanohub
- Lecture 32 - Forward and reverse biased PN junctions
- Lecture 33 - Minority carrier injection in PN junctions
- Lecture 34 - Current in forward biased PN junction
- Lecture 35 - Current in reverse biased PN junction
- Lecture 36 - Depletion capacitance in PN junction
- Lecture 37 - Non-idealities in PN junction diode
- Lecture 38 - Nanohub Demo - PN Junction with applied bias
- Lecture 39 - Schottky barrier in metal-semiconductor junction
- Lecture 40 - Current flow across a Schottky barrier
- Lecture 41 - Ohmic vs rectifying contacts
- Lecture 42 - An Ideal MOS Capacitor
- Lecture 43 - Operating regimes of a MOSCAP
- Lecture 44 - Simplified band diagrams of accumulation and depletion in MOSCAP
- Lecture 45 - Inversion in a MOSCAP
- Lecture 46 - NMOSCAP in accumulation mode
- Lecture 47 - NMOSCAP in depletion mode
- Lecture 48 - NMOSCAP in inversion mode
- Lecture 49 - Exact solution vs delta-depletion approximation
- Lecture 50 - Threshold voltage in a MOSCAP
- Lecture 51 - Nanohub Demo - MOSCAP tool
- Lecture 52 - Non-ideal MOS Capacitor
- Lecture 53 - MOSCAP Capacitance-Voltage (CV) Characteristics
- Lecture 54 - Example problems with MOSCAPs
- Lecture 55 - Impact of doping, oxide thickness and temperature on CV
- Lecture 56 - Nanohub Demo - MOS CV
- Lecture 57 - Introduction to MOSFET
- Lecture 58 - Operating modes of a MOSFET
- Lecture 59 - IV Characteristics of a long channel MOSFET
- Lecture 60 - Example problems with MOSFETs
- Lecture 61 - MOSFET device metrics
- Lecture 62 - CMOS Technology
- Lecture 63 - MOSFET Scaling and technology nodes
- Lecture 64 - Limits of scaling
- Lecture 65 - Current characteristics of a short channel MOSFET
- Lecture 66 - Threshold voltage characteristics of short channel MOSFET
- Lecture 67 - MOSFETs in the 21st century
- Lecture 68 - Optical absorption and bandgap

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

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- Lecture 69 - Introduction to solar cells
- Lecture 70 - Efficiency of a solar cell
- Lecture 71 - Types of photodetectors
- Lecture 72 - PIN and avalanche Photodetectors
- Lecture 73 - Photodetector metrics
- Lecture 74 - Radiative absorption and emission processes
- Lecture 75 - Materials for optoelectronic devices
- Lecture 76 - Operation of a light emitting diode (LED)
- Lecture 77 - LED emission spectrum
- Lecture 78 - Stimulated emission and lasing

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

NPTEL Video Course - Electrical Engineering - NOC:Electric Vehicles and Renewable Energy

Subject Co-ordinator - Prof. Ashok Jhunjunwala, Prof. Prabhjot Kaur, Prof. Kaushal Kumar Jha, Prof. L Kannan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Electric Vehicle Introduction
- Lecture 2 - The drive Torque, Power, Speed and Energy
- Lecture 3 - Energy Source
- Lecture 4 - Vehicle Auxillary, Petrol pumps and Charging stations
- Lecture 5 - Introduction to Electric Vehicles in India
- Lecture 6 - Can India Drive its EV program Innovatively and Differently and scale
- Lecture 7 - Battery Cost reduction strategy
- Lecture 8 - A bit about Batteries, Charging and Swapping Infrastructure
- Lecture 9 - Where will we get Lithium for batteries and EV Subsystems
- Lecture 10 - Forces acting when a vehicle move
- Lecture 11 - Aerodynamic drag, Rolling Resistance and Uphill Resistance
- Lecture 12 - Power and torque to accelerate
- Lecture 13 - Putting it all together - 1
- Lecture 14 - Putting it all together - 2
- Lecture 15 - Concept of drive cycle - 1
- Lecture 16 - Concept of drive cycle - 2
- Lecture 17 - Drive Cycles and Energy used per km - Part 1
- Lecture 18 - Drive Cycles and Energy used per km - Part 2
- Lecture 19 - EV Subsystem: Design of EV Drive Train - Part 1
- Lecture 20 - EV Subsystem: Design of EV Drive Train - Part 2
- Lecture 21 - Introduction to Battery Parameters - Part 1
- Lecture 22 - Introduction to Battery Parameters - Part 2
- Lecture 23 - Why Lithium Ion Battery? - Part 1
- Lecture 24 - Why Lithium Ion Battery? - Part 2
- Lecture 25 - Batteries in Future
- Lecture 26 - Li-Ion Battery Cells
- Lecture 27 - SoH and SoC estimation and Self Discharge - Part 1
- Lecture 28 - SoH and SoC estimation and Self Discharge - Part 2
- Lecture 29 - Battery Pack Development - Part 1

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

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- Lecture 30 - Battery Pack Development - Part 2
- Lecture 31 - Computation of Effective cost of battery - Part 1
- Lecture 32 - Computation of Effective cost of battery - Part 2
- Lecture 33 - Charging Batteries
- Lecture 34 - Fundamentals of Battery Pack Design
- Lecture 35 - Electrical Design of Battery Pack - Part 1
- Lecture 36 - Electrical Design of Battery Pack - Part 2
- Lecture 37 - Electrical Design of Battery Pack - Part 3
- Lecture 38 - Mechanical Design of Battery Pack - Part 1
- Lecture 39 - Mechanical Design of Battery Pack - Part 2
- Lecture 40 - Mechanical Design of Battery Pack - Part 3
- Lecture 41 - Mechanical Design of Battery Pack - Part 4
- Lecture 42 - Thermal Design of Battery Pack - Part 1
- Lecture 43 - Thermal Design of Battery Pack - Part 2
- Lecture 44 - Thermal Design of Battery Pack - Part 3
- Lecture 45 - Thermal Design of Battery Pack - Part 4
- Lecture 46 - BMS Design and Embedded System - Part 1
- Lecture 47 - BMS Design and Embedded System - Part 2
- Lecture 48 - BMS Design and Embedded System - Part 3
- Lecture 49 - BMS Design and Embedded System - Part 4
- Lecture 50 - BMS Design and Embedded System - Part 5
- Lecture 51 - Cell Testing and Characterization - Part 1
- Lecture 52 - Cell Testing and Characterization - Part 2
- Lecture 53 - EV Motors and Controllers - Vehicle Dynamics - Part 1
- Lecture 54 - EV Motors and Controllers - Vehicle Dynamics - Part 2
- Lecture 55 - EV Motors and Controllers - Understanding Flow - Part 1
- Lecture 56 - EV Motors and Controllers - Understanding Flow - Part 2
- Lecture 57 - Power and Efficiency
- Lecture 58 - Torque Production - Part 1
- Lecture 59 - Torque Production - Part 2
- Lecture 60 - Torque Production - Part 3
- Lecture 61 - Speed and Back EMF
- Lecture 62 - The d-q Equivalent circuit - Part 1
- Lecture 63 - The d-q Equivalent circuit - Part 2
- Lecture 64 - Field-oriented Control
- Lecture 65 - Three phase AC - Part 1
- Lecture 66 - Three phase AC - Part 2
- Lecture 67 - Thermal Design - Part 1
- Lecture 68 - Thermal Design - Part 2

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

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- Lecture 69 - Thermal Design - Part 3
- Lecture 70 - Engineering Considerations - Part 1
- Lecture 71 - Engineering Considerations - Part 2
- Lecture 72 - Engineering Considerations - Part 3 and Future Frontiers
- Lecture 73 - EV Charger Introduction
- Lecture 74 - Charger Parameters and Types
- Lecture 75 - Slow Fast chargers and Swapping
- Lecture 76 - Swapping
- Lecture 77 - Standardization and on board chargers
- Lecture 78 - Public chargers
- Lecture 79 - Public charger economics in Indian Context
- Lecture 80 - Bulk Chargers, Swapping stations and data analytics
- Lecture 81 - Introduction to Energy Scenario in India - Part 1
- Lecture 82 - Introduction to Energy Scenario in India - Part 2
- Lecture 83 - A novel Approach towards 100% RE in India - Part 1
- Lecture 84 - A novel Approach towards 100% RE in India - Part 2
- Lecture 85 - Going Beyond solar, wind, Li Ion and chilled water storage
- Lecture 86 - Solar Photovoltaic
- Lecture 87 - Solar Cell and its Characteristics
- Lecture 88 - Solar Cells to Modules
- Lecture 89 - Wind Energy
- Lecture 90 - The War of Currents
- Lecture 91 - The Birth of Solar - DC
- Lecture 92 - Storage Options for Energy - Part 1
- Lecture 93 - Storage Options for Energy - Part 2
- Lecture 94 - Storage Options for Energy - Part 3
- Lecture 95 - Storage Options for Energy - Part 4
- Lecture 96 - The EV Ecosystem - Part 1
- Lecture 97 - The EV Ecosystem - Part 2

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

NPTEL Video Course - Electrical Engineering - Phase-locked loops

Subject Co-ordinator - Dr. Saurabh Saxena

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Course Introduction and Motivation - Part I
- Lecture 2 - Course Introduction and Motivation - Part II
- Lecture 3 - Basic Operation of a Phase Locked Loop
- Lecture 4 - Simple Implementation of a Phase Locked Loop
- Lecture 5 - Input Output Characteristics of Basic PLL Blocks
- Lecture 6 - Time Domain Analysis of a Simple PLL
- Lecture 7 - Time Domain Versus Small Signal Analysis of a Simple PLL
- Lecture 8 - Type and Order of PLL
- Lecture 9 - Small Signal Analysis of Type-I/II/III PLLs for Phase Step, Frequency Step and Frequency Ramp
- Lecture 10 - Frequency Acquisition Range for PLLs
- Lecture 11 - Frequency Acquisition in Type-I PLLs
- Lecture 12 - Frequency Acquisition Limits in Type-I PLLs
- Lecture 13 - Frequency Acquisition in Type II PLLs
- Lecture 14 - Frequency Acquisition Ranges in Type II PLLs with Ideal and Non Ideal Integrator
- Lecture 15 - Frequency Domain Insight in Frequency Acquisition for Type II PLLs
- Lecture 16 - Introduction to Clock Multipliers
- Lecture 17 - Analog Phase Error Detectors - Part I
- Lecture 18 - Analog Phase Error Detectors - Part II
- Lecture 19 - Digital Phase Error Detectors - Part I
- Lecture 20 - Digital Phase Error Detectors - Part II
- Lecture 21 - Range Extension for Phase Error Detectors
- Lecture 22 - Phase Frequency Detector
- Lecture 23 - Digital Frequency Detector
- Lecture 24 - Charge Pump PLL
- Lecture 25 - Small Signal and Stability Analysis of Type II Order 2 Charge Pump PLL
- Lecture 26 - Problems in Charge Pump PLL - Dead Zone in PFD
- Lecture 27 - Problems in Charge Pump PLL - Reference Spur
- Lecture 28 - Design Procedure for Type-II Order 3 Charge Pump PLL
- Lecture 29 - Design Procedure for Charge Pump Clock Multiplier

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

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- Lecture 30 - Sources of Non-Linearities in CP-PLL - Part I
- Lecture 31 - Sources of Non-Linearities in CP-PLL - Part II
- Lecture 32 - Noise Analysis in CP-PLL - Part I
- Lecture 33 - Noise Analysis in CP PLL - Part II
- Lecture 34 - Noise Analysis in CP-PLL - Part III
- Lecture 35 - Noise Simulations for CP-PLL Blocks
- Lecture 36 - Introduction to Oscillators
- Lecture 37 - Low Swing Ring Oscillator - Part I
- Lecture 38 - Low-Swing Ring Oscillator - Part II
- Lecture 39 - Large-Swing Ring Oscillator - Part I
- Lecture 40 - Large-Swing Ring Oscillator - Part II
- Lecture 41 - Large-Swing Ring Oscillator - Part III
- Lecture 42 - Large-Swing Ring Oscillator - Part IV
- Lecture 43 - Large-Swing Ring Oscillator - Part V
- Lecture 44 - Supply Regulated VCO - Part I
- Lecture 45 - Supply Regulated VCO - Part II
- Lecture 46 - Supply Regulated VCO - Part III
- Lecture 47 - Phase Noise in Ring Oscillators
- Lecture 48 - Circuit level Design of PFD - Part I
- Lecture 49 - Circuit level Design of PFD - Part II
- Lecture 50 - Circuit level Design of PFD - Part III
- Lecture 51 - Circuit level Design of Charge Pump - Part I
- Lecture 52 - Circuit-level Design of Charge Pump - Part II
- Lecture 53 - Circuit-level Design of Charge Pump - Part III
- Lecture 54 - Circuit-level Design of Charge Pump - Part IV
- Lecture 55 - Circuit-level Design of Charge Pump - Part V
- Lecture 56 - Circuit-level Design of Charge Pump - Part VI
- Lecture 57 - Circuit-level Design of Clock Frequency Divider
- Lecture 58 - Techniques for Wide Frequency Range Clock Multiplier
- Lecture 59 - Introduction to Digital PLL
- Lecture 60 - Design of Time-to-Digital Converter
- Lecture 61 - Small Signal Analysis of Digital PLL
- Lecture 62 - Noise Analysis in Digital PLL
- Lecture 63 - Analog/Digital Hybrid PLL - Part I
- Lecture 64 - Analog/Digital Hybrid PLL - Part II
- Lecture 65 - Course Summary

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

NPTEL Video Course - Electrical Engineering - NOC:Fundamentals of Nano and Quantum Photonics

Subject Co-ordinator - Prof. Naresh Kumar Emani

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Review of Maxwell's Equations  
Lecture 2 - Wave Equation  
Lecture 3 - Dispersion Relation  
Lecture 4 - Propagating and Evanescent Waves  
Lecture 5 - Diffraction Limit and Spatial Frequencies  
Lecture 6 - Plane Waves  
Lecture 7 - Optical Response of Materials  
Lecture 8 - Lorentz Model  
Lecture 9 - Properties of Lorentz Oscillator Model  
Lecture 10 - Drude-Lorentz Model for Metals  
Lecture 11 - Kramers-Kronig Relation  
Lecture 12 - Engineering Optical Response of Materials  
Lecture 13 - Low dimensional systems  
Lecture 14 - Absorption in Semiconductors  
Lecture 15 - Optical gain in semiconductors  
Lecture 16 - Absorption in low-dimensional semiconductors  
Lecture 17 - Selection rules for optical processes  
Lecture 18 - Scattering of EM radiation  
Lecture 19 - LSPR: Quasi-static approximation  
Lecture 20 - Size dependence of Plasmon Resonance  
Lecture 21 - Tuning Plasmonic Resonances  
Lecture 22 - Surface Plasmon Polariton(SPP)  
Lecture 23 - Understanding SPP Dispersion Diagram  
Lecture 24 - Exciting Surface Plasmon Polaritons  
Lecture 25 - Analytical Calculation of Scattering Coefficients - IPython code overview  
Lecture 26 - EM Waves in Multilayer Stack - T Matrix formulation  
Lecture 27 - Photonic Bandgap in 1D  
Lecture 28 - EM Waves in 1D Photonic Crystal  
Lecture 29 - Diffracton Grating

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

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- Lecture 30 - Applications of Photonic Crystals
- Lecture 31 - PhC in 1D - T-matrix examples
- Lecture 32 - Introduction to Metamaterials
- Lecture 33 - Metamaterials at GHz and THz frequencies
- Lecture 34 - Negative index materials at optical frequencies
- Lecture 35 - Plasmonic Metasurfaces
- Lecture 36 - Dielectric Metasurfaces
- Lecture 37 - Tunable and Active Metamaterials
- Lecture 38 - Radiative Absorption and Emission
- Lecture 39 - Miniaturization of Integrated Photonic Devices
- Lecture 40 - Recent trends in nanoscale lasers
- Lecture 41 - Non-Hermitian Systems
- Lecture 42 - Resonant light-atom interactions
- Lecture 43 - Experimental observation of Rabi oscillations
- Lecture 44 - Atom-Cavity Interaction - Weak and strong coupling regimes
- Lecture 45 - Experimental observation of weak and strong coupling
- Lecture 46 - Fabrication of nanophotonic structures - 1
- Lecture 47 - Fabrication of nanophotonic structures - 2
- Lecture 48 - Measuring light quanta
- Lecture 49 - Photon Statistics
- Lecture 50 - Photodetection and shot noise limit
- Lecture 51 - Second order correlation function
- Lecture 52 - Hanbury Brown-Twiss Experiment with Photons
- Lecture 53 - EM Waves as harmonic oscillator
- Lecture 54 - Vacuum fluctuations
- Lecture 55 - Coherent and squeezed states
- Lecture 56 - Squeezed and photon number states
- Lecture 57 - Application of squeezed states
- Lecture 58 - Preliminaries for quantum theory of light
- Lecture 59 - Quantum theory of light
- Lecture 60 - Operator solution of quantum harmonic oscillator
- Lecture 61 - Photon number states
- Lecture 62 - Field quadratures and operators
- Lecture 63 - Uncertainty relations for quantum light
- Lecture 64 - Applications of quantum light - Quantum Key Distribution

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

NPTEL Video Course - Electrical Engineering - NOC:Analog Electronic Circuits (IITM)

Subject Co-ordinator - Prof. Shanthi Pavan

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction Linear and Nonlinear Network
- Lecture 2 - Small Signal Analysis of Nonlinear Networks
- Lecture 3 - Small Signal Analysis
- Lecture 4 - Incremental Model for Common Two Terminal Element Passive Two Terminal Elements
- Lecture 5 - Linear and Nonlinear Two Ports and the Incremental Y Matrix
- Lecture 6 - Graphical Representation of the Y Matrix
- Lecture 7 - Nonlinear Two Ports With Incremental Gain
- Lecture 8 - IV Characteristic of a Nonlinear 2 port with Incremental Gain
- Lecture 9 - The MOSFET and its Characteristics
- Lecture 10 - Deriving the Common V Source Amplifier - Part 1
- Lecture 11 - The Common Source Amplifier
- Lecture 12 - Large Signal Behaviour of the Common Source Amplifier
- Lecture 13 - The Common Source Amplifier Swing Limits
- Lecture 14 - Introduction to Robust Biasing
- Lecture 15 - Robust Biasing Part 1 Common Source Amplifier with DC Drain Feedback
- Lecture 16 - Robust Biasing with the Current Mirror and Drain Gate Resistor
- Lecture 17 - Robust Biasing With Source Feedback - Part 1
- Lecture 18 - Robust Biasing with Source Feedback - Part 2
- Lecture 19 - Robust Biasing with Source Degeneration
- Lecture 20 - Introduction to Negative Feedback
- Lecture 21 - The Ideal Operational Amplifier
- Lecture 22 - Negative Feedback (Continued...)
- Lecture 23 - Robust Biasing with Drain Measurement and Source Feedback
- Lecture 24 - Robust biasing with source measurement and gate feedback
- Lecture 25 - The Incremental Voltage Controlled Voltage Source The Common drain Amplifier Incremental Picture
- Lecture 26 - Biasing of the Common Drain Amplifier and Signal Swings
- Lecture 27 - The VCVS Continued, the Incremental
- Lecture 28 - Introducing the Current Controlled Voltage Source
- Lecture 29 - The Incremental Current Controlled Voltage Source Transimpedance Amplifier

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

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- Lecture 30 - The Transimpedance amplifier (Continued...)
- Lecture 31 - The Incremental current controlled current source, the common gate amplifier
- Lecture 32 - Summary of controlled Sources and finite output Impedance of the Transistor
- Lecture 33 - Effect of Finite Output Resistance on the Basic Building Blocks - Part 1
- Lecture 34 - Effect of Finite Output Resistance on the Basic Building Blocks - Part 2
- Lecture 35 - Effect of Finite Output Resistance on the Basic Building Blocks - Part 3
- Lecture 36 - Finite output Effect in current Mirrors the Cascode Current Mirror
- Lecture 37 - Comparison of Current Mirrors The High Swing Cascode
- Lecture 38 - Precision High Swing Cascode
- Lecture 39 - The PMOS transistor
- Lecture 40 - Small Signal Model and Bias Stabilization
- Lecture 41 - Basic Building Blocks with PMOS Devices
- Lecture 42 - Fixed Transconductance Bias Circuits from First Principles
- Lecture 43 - Limitation of a Resistive Load
- Lecture 44 - The Active Load
- Lecture 45 - The Active Load (Continued...)
- Lecture 46 - The CMOS Inverter
- Lecture 47 - The CMOS Inverter (Continued...)
- Lecture 48 - The Differential Amplifier
- Lecture 49 - Half - Circuit Analysis
- Lecture 50 - The Different Amplifier with Active Load - Part 1
- Lecture 51 - The Different Amplifier with Active Load - Part 2
- Lecture 52 - Large Signal Behaviour of the Different Pair
- Lecture 53 - The two Stage Opamp and Single Supply Operation
- Lecture 54 - The two Stage Opamp (Continued...)
- Lecture 55 - The Two Stage Opamp (Continued...)
- Lecture 56 - Swing Limits of the Two Stage OTA
- Lecture 57 - The Two-Stage Opamp
- Lecture 58 - The Bandgap Reference Principle
- Lecture 59 - The Bandgap Reference - Part 1
- Lecture 60 - The Bandgap Reference - Part 2
- Lecture 61 - Memory Effects in MOS Transistors
- Lecture 62 - The Common Source Amplifier with Parasitic Capacitances
- Lecture 63 - The Common Source Amplifier with Parasitic Capacitances
- Lecture 64 - Frequency Response of the Common Drain Amplifier
- Lecture 65 - Frequency Response of the Common Gate Amplifier
- Lecture 66 - Stability of Negative Feedback System The First Order Forward Amplifier
- Lecture 67 - Stability of Second Order Feedback System
- Lecture 68 - Stability of Third Order Negative Feedback System

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- Lecture 69 - Dominant Pole Compensation - Part 1
- Lecture 70 - Dominant Pole Compensation - Part 2
- Lecture 71 - Phase Margin
- Lecture 72 - Example Phase Margin Calculations
- Lecture 73 - Dominant Pole Compensation Summary
- Lecture 74 - Phase Margin Example
- Lecture 75 - The 2 Stage Miller Compensated Amplifier
- Lecture 76 - 2 Stage Operational Amplifier and Miller Compensation (Continued...)
- Lecture 77 - Intuition Behind the Dominant and Second Poles in a Miller Compensated OTA
- Lecture 78 - 2 Stage Operational Amplifier and Miller Compensation Cancelling the RHP Zero
- Lecture 79 - Miller Compensation OTA Schematic
- Lecture 80 - Bipolar Junction Transistor Circuits-Device Equations and Small Signal Model
- Lecture 81 - BJT Biasing and Basic Building Blocks
- Lecture 82 - Bipolar Junction Transistor Circuits Swing Limits and Two Stage Opamp
- Lecture 83 - Input Stage of the 741 Opamp
- Lecture 84 - Basic Analysis of the 741

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

NPTEL Video Course - Electrical Engineering - NOC:Modern Computer Vision

Subject Co-ordinator - Prof. A. N. Rajagopalan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Course introduction - 1  
Lecture 2 - Course introduction - 2  
Lecture 3 - Introduction to Deep Learning - 1  
Lecture 4 - Introduction to Deep Learning - 2  
Lecture 5 - Introduction to Deep Learning - 3  
Lecture 6 - Introduction to Neuron - 1  
Lecture 7 - Introduction to Neuron - 2  
Lecture 8 - Introduction to Neuron - 3  
Lecture 9 - Multilayer Perceptron  
Lecture 10 - Regression and classification losses  
Lecture 11 - Training a neural network  
Lecture 12 - Gradient descent  
Lecture 13 - Activation function  
Lecture 14 - Backpropagation in MLP - 1  
Lecture 15 - Backpropagation in MLP - 2  
Lecture 16 - Optimization and Regularization - 1  
Lecture 17 - Optimization and Regularization - 2  
Lecture 18 - Regularization  
Lecture 19 - Dropout  
Lecture 20 - Pre-processing  
Lecture 21 - Convolutional Neural Networks - 1  
Lecture 22 - Convolutional Neural Networks - 2  
Lecture 23 - Convolutional Neural Networks - 3  
Lecture 24 - CNN Properties  
Lecture 25 - Alexnet  
Lecture 26 - CNN Architectures - 1  
Lecture 27 - CNN Architectures - 2  
Lecture 28 - CNN Architectures - 3  
Lecture 29 - Introduction to RNN - 1

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

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- Lecture 30 - Introduction to RNN - 2
- Lecture 31 - Encoder-Decoder models in RNN
- Lecture 32 - LSTM
- Lecture 33 - Low-level vision - 1
- Lecture 34 - Low-level vision - 2
- Lecture 35 - Low-level vision - 3
- Lecture 36 - Spatial Domain Filtering
- Lecture 37 - Frequency Domain Filtering
- Lecture 38 - Edge Detection - 1
- Lecture 39 - Edge Detection - 2
- Lecture 40 - DeepNets for Edge Detection
- Lecture 41 - Line detection
- Lecture 42 - Feature detectors
- Lecture 43 - Harris Corner Detector - 1
- Lecture 44 - Harris Corner Detector - 2
- Lecture 45 - Harris Corner Detector - 3
- Lecture 46 - Blob detection - 1
- Lecture 47 - Blob detection - 2
- Lecture 48 - Blob detection - 3
- Lecture 49 - SIFT - 1
- Lecture 50 - SIFT - 2
- Lecture 51 - Feature descriptors - 1
- Lecture 52 - Feature descriptors - 2
- Lecture 53 - SURF - 1
- Lecture 54 - SURF - 2
- Lecture 55 - Single-View Geometry - 1
- Lecture 56 - Single-View Geometry - 2
- Lecture 57 - 2D Geometric transformations - 1
- Lecture 58 - 2D Geometric transformations - 2
- Lecture 59 - Camera intrinsics and extrinsics - 1
- Lecture 60 - Camera intrinsics and extrinsics - 2
- Lecture 61 - Two-view stereo - 1
- Lecture 62 - Two-view stereo - 2
- Lecture 63 - Two-view stereo - 3
- Lecture 64 - Algebraic representation of epipolar geometry - 1
- Lecture 65 - Algebraic representation of epipolar geometry - 2
- Lecture 66 - Fundamental matrix computation - 1
- Lecture 67 - Fundamental matrix computation - 2
- Lecture 68 - Structure from Motion - 1

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

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- Lecture 69 - Structure from Motion - 2
- Lecture 70 - Structure from Motion - 3
- Lecture 71 - Batch processing in SFM
- Lecture 72 - Multi-view SFM
- Lecture 73 - Factorization methods in SFM
- Lecture 74 - Bundle adjustment
- Lecture 75 - Dense 3D reconstruction
- Lecture 76 - Some results in Stereo and SFM
- Lecture 77 - Deepnets for stereo and SFM - 1
- Lecture 78 - Deepnets for stereo and SFM - 2
- Lecture 79 - Mid-level vision - 1
- Lecture 80 - Mid-level vision - 2
- Lecture 81 - Lucas-Kanade method for OF
- Lecture 82 - Handling large motion in optical flow
- Lecture 83 - Image segmentation
- Lecture 84 - GMM for clustering
- Lecture 85 - Deepnets for Segmentation and OF -1
- Lecture 86 - Deepnets for Segmentation and OF -2
- Lecture 87 - Deepnets for Segmentation and OF -3
- Lecture 88 - Deepnets for Object Detection - 1
- Lecture 89 - Deepnets for Object Detection - 2
- Lecture 90 - Vision and Language

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

NPTEL Video Course - Electrical Engineering - NOC:Optical Wireless Communications for Beyond 5G Networks and

Subject Co-ordinator - Prof. Anand Srivastava

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Optical Wireless Communications (OWC)

Lecture 2 - Basics of Lighting System

Lecture 3 - Optical Sources (LED)

Lecture 4 - Optical Sources (LASER)

Lecture 5 - Photodetectors

Lecture 6 - Photodetectors (Continued...)

Lecture 7 - SNR for PIN and APD

Lecture 8 - Indoor OWC channel modelling

Lecture 9 - Indoor OWC channel modelling (Continued...)

Lecture 10 - Channel model for single source

Lecture 11 - Channel model for multiple sources

Lecture 12 - MIMO channel

Lecture 13 - MIMO channel (Continued...)

Lecture 14 - Outdoor Optical Channel Modelling

Lecture 15 - Range equation of FSO link

Lecture 16 - Range equation of FSO link (Continued...)

Lecture 17 - Atmospheric Turbulence

Lecture 18 - Atmospheric Turbulence (Continued...)

Lecture 19 - Turbulence Mitigation techniques

Lecture 20 - Underwater OWC Channel Model

Lecture 21 - Underwater OWC Channel Model (Continued...)

Lecture 22 - Modulation Schemes for OWC, BER for OOK

Lecture 23 - BER of M-PPM, BER of L-PPM

Lecture 24 - Differential Pulse Interval Modulation (DPIM) and (DAPPM)

Lecture 25 - Variable Pulse Position Modulation (VPPM)

Lecture 26 - OFDM Basics

Lecture 27 - Cyclic Prefix (CP), OFDM with CP, BER of OFDM System

Lecture 28 - Frequency Offset in OFDM, PAPR in OFDM

Lecture 29 - OFDM in VLC, DCO-OFDM

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

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- Lecture 30 - ACO-OFDM
- Lecture 31 - Color Shift Keying (CSK)
- Lecture 32 - Higher order CSK
- Lecture 33 - NOMA
- Lecture 34 - NOMA VLC
- Lecture 35 - MIMO
- Lecture 36 - VLC based MIMO NOMA
- Lecture 37 - Power allocation in VLC based MIMO NOMA
- Lecture 38 - Hybrid Network LiFi and WiFi Coexistence
- Lecture 39 - Vehicle to Vehicle communication using Visible light
- Lecture 40 - Anand Singh Part - 1
- Lecture 41 - Anand Singh Part - 2
- Lecture 42 - Dilnashin lecture - 1
- Lecture 43 - Saswati Paramita
- Lecture 44 - Dilnashin Tutorial - 2
- Lecture 45 - Guriendar Prof Anand 001
- Lecture 46 - Rehana Prof Anand

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

NPTEL Video Course - Electrical Engineering - NOC:VLSI Design Flow: RTL to GDS

Subject Co-ordinator - Prof. Sneha Saurabh

Co-ordinating Institute - IIIT - Delhi

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

Lecture 1 - Basic Concepts of Integrated Circuit - I  
Lecture 2 - Basic Concepts of Integrated Circuit - II  
Lecture 3 - Overview of VLSI Design Flow - I  
Lecture 4 - Overview of VLSI Design Flow - II  
Lecture 5 - Tutorial 1  
Lecture 6 - Overview of VLSI Design Flow - III  
Lecture 7 - Overview of VLSI Design Flow - IV  
Lecture 8 - Overview of VLSI Design Flow - V  
Lecture 9 - Overview of VLSI Design Flow - VI  
Lecture 10 - Introduction to TCL  
Lecture 11 - Hardware Modeling: Introduction to Verilog - I  
Lecture 12 - Hardware Modeling: Introduction to Verilog - II  
Lecture 13 - Functional Verification using Simulation  
Lecture 14 - High-level synthesis using Bambu - Tutorial 3  
Lecture 15 - RTL Synthesis - Part I  
Lecture 16 - RTL Synthesis - Part II  
Lecture 17 - Logic Optimization - Part I  
Lecture 18 - Simulation-based Verification using Icarus  
Lecture 19 - Logic Optimization - Part II  
Lecture 20 - Logic Optimization - Part III  
Lecture 21 - Formal Verification - I  
Lecture 22 - Logic Synthesis using Yosys  
Lecture 23 - Formal Verification - II  
Lecture 24 - Formal Verification - III  
Lecture 25 - Formal Verification - IV  
Lecture 26 - Technology Library  
Lecture 27 - Logic Optimization using Yosys  
Lecture 28 - Static Timing Analysis - I  
Lecture 29 - Static Timing Analysis - II

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

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- Lecture 30 - Static Timing Analysis - III
- Lecture 31 - Static Timing Analysis using OpenSTA
- Lecture 32 - Constraints - I
- Lecture 33 - Constraints - II
- Lecture 34 - Technology Mapping
- Lecture 35 - Timing-driven Optimization
- Lecture 36 - Technology Library and Constraints
- Lecture 37 - Power Analysis
- Lecture 38 - Power Optimization
- Lecture 39 - Basic Concepts of DFT
- Lecture 40 - Scan Design Flow
- Lecture 41 - Power Analysis using OpenSTA
- Lecture 42 - Automatic Test Pattern Generation (ATPG)
- Lecture 43 - Built-in Self Test (BIST)
- Lecture 44 - Basic Concepts for Physical Design - I
- Lecture 45 - Basic Concepts for Physical Design - II
- Lecture 46 - Installation of OpenRoad
- Lecture 47 - Chip Planning - I
- Lecture 48 - Chip Planning - II
- Lecture 49 - Placement
- Lecture 50 - Chip Planning and Placement
- Lecture 51 - Clock Tree Synthesis (CTS)
- Lecture 52 - Routing
- Lecture 53 - Post-layout Verification and Signoff
- Lecture 54 - Clock Tree Synthesis (CTS) and Routing

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

NPTEL Video Course - Electrical Engineering - NOC:Fundamentals of Wireless Communication (Hindi)

Subject Co-ordinator - Dr.Vivek Bohara

Co-ordinating Institute - IIIT - Delhi

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

Lecture 1 - Introduction to the Course  
Lecture 2 - Basics of Wireless Communication Systems  
Lecture 3 - Path-Loss Models for a Wireless Channel  
Lecture 4 - Log-Normal Shadowing  
Lecture 5 - Small-Scale Fading  
Lecture 6 - Statistical Multipath Channel Models  
Lecture 7 - MATLAB programming for Path Loss Models  
Lecture 8 - Statistical Multipath Channel Models - Part 1  
Lecture 9 - Statistical Multipath Channel Models - Part 2  
Lecture 10 - Digital Modulation and Detection (Binary Modulations) - Part 1  
Lecture 11 - Digital Modulation and Detection (Binary Modulations) - Part 2  
Lecture 12 - Digital Modulation and Detection (Binary Modulations) - Part 3  
Lecture 13 - MATLAB programming for Wireless Fading Channels  
Lecture 14 - Digital Modulation and Detection (Binary Modulations) - Part 1  
Lecture 15 - Digital Modulation and Detection (Binary Modulations) - Part 2  
Lecture 16 - Digital Modulation and Detection (M-ary Modulation) - Part 1  
Lecture 17 - Digital Modulation and Detection (M-ary Modulation) - Part 2  
Lecture 18 - Digital Modulation and Detection (M-ary Modulation) - Part 3  
Lecture 19 - MATLAB programming for Modulation Schemes  
Lecture 20 - Digital Modulation and Detection (GMSK)  
Lecture 21 - Performance of Digital Modulation over Wireless Channels  
Lecture 22 - Performance of Digital Modulation over Wireless Channels  
Lecture 23 - MATLAB programming: Error performance in AWGN channel  
Lecture 24 - Receiver Diversity Techniques - Part 1  
Lecture 25 - Receiver Diversity Techniques - Part 2  
Lecture 26 - Receiver Diversity Techniques - Part 3  
Lecture 27 - Error performance in Fading Channel Part 1  
Lecture 28 - Error performance in Fading Channel Part 2  
Lecture 29 - Multi-Carrier Modulation and OFDM - Part 1

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

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- Lecture 30 - Multi-Carrier Modulation and OFDM - Part 2
- Lecture 31 - Multi-Carrier Modulation and OFDM - Part 3
- Lecture 32 - Multi-Carrier Modulation and OFDM - Part 4
- Lecture 33 - Numerical on OFDM
- Lecture 34 - Programming for OFDM
- Lecture 35 - OFDM System with Cyclic Prefix
- Lecture 36 - OFDM Signal Transmission and OFDM System Design
- Lecture 37 - Advantages and Drawbacks of OFDM System
- Lecture 38 - OFDM Standards
- Lecture 39 - Multiple Access Schemes
- Lecture 40 - Technologies for Wireless Cellular Standards

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

NPTEL Video Course - Electrical Engineering - NOC:Sensor Technologies: Physics, Fabrication, and Circuits

Subject Co-ordinator - Prof.Mitradip Bhattacharjee

Co-ordinating Institute - IISER - Bhopal

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

Lecture 1 - Sensors and Transducers - Basics  
Lecture 2 - Introduction to Sensors  
Lecture 3 - Materials for sensors  
Lecture 4 - Multidisciplinary Aspects of Sensors  
Lecture 5 - Introduction to Sensor Parameters  
Lecture 6 - Sensor Parameters - II  
Lecture 7 - Sensor Parameters - III  
Lecture 8 - Sensor Parameters - IV  
Lecture 9 - Sensor Parameters - V  
Lecture 10 - Numerical Examples  
Lecture 11 - Introduction: Physics of Sensors  
Lecture 12 - Capacitive Sensor Architecture  
Lecture 13 - Different Types of Capacitive Sensors  
Lecture 14 - Thermal Sensors Basics  
Lecture 15 - Dynamic Condition of Thermal Sensors  
Lecture 16 - Classification of Thermal Sensors  
Lecture 17 - Chemical Sensor Basics  
Lecture 18 - Electrochemical Sensors  
Lecture 19 - Impedimetric Sensors  
Lecture 20 - Numerical Examples  
Lecture 21 - Physics of Optical Sensors  
Lecture 22 - Physics of Magnetic Sensors  
Lecture 23 - Physics of Acoustic Sensors  
Lecture 24 - Physics of Microfluidic Sensors  
Lecture 25 - Various Sensor Geometries and Examples  
Lecture 26 - Microfabrication Technologies  
Lecture 27 - Deposition Techniques  
Lecture 28 - Physical Vapor Deposition  
Lecture 29 - Chemical Vapor Deposition

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

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- Lecture 30 - Patterning Techniques
- Lecture 31 - Lithography Techniques
- Lecture 32 - Basics of Etching Techniques
- Lecture 33 - Dry Etching Techniques
- Lecture 34 - Optical and Electron Microscopy
- Lecture 35 - Other Microscopy Techniques
- Lecture 36 - Sensor System: Basic Circuits
- Lecture 37 - Amplifier Circuits
- Lecture 38 - Instrumentation Amplifier
- Lecture 39 - Filter Circuits
- Lecture 40 - Sensor System: Experimental Demonstration

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

NPTEL Video Course - Electrical Engineering - NOC:Advanced topics in Wireless Communication (Hindi)

Subject Co-ordinator - Prof. Vivek Ashok Bohara

Co-ordinating Institute - IIIT - Delhi

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

- Lecture 1 - Overview of Advanced Topics in Wireless Communication System - Part A
- Lecture 2 - Overview of Advanced Topics in Wireless Communication System - Part B
- Lecture 3 - Revision of Wireless Fundamentals - Part A
- Lecture 4 - Revision of Wireless Fundamentals - Part B
- Lecture 5 - Revision of Wireless Fundamentals - Part C
- Lecture 6 - Revision of Wireless Fundamentals - Part D
- Lecture 7 - Revision of Wireless Fundamentals - Part E
- Lecture 8 - Channel Capacity in AWGN channel
- Lecture 9 - Channel Capacity in flat fading channel
- Lecture 10 - Channel Capacity with Optimal Power Adaptation
- Lecture 11 - Tutorial 1 - MATLAB Tutorial: Channel Capacity
- Lecture 12 - Introduction to Channel Coding
- Lecture 13 - Channel Coding: Uncoded and Coded Performance
- Lecture 14 - Introduction to Linear Block Codes
- Lecture 15 - Tutorial 2 - MATLAB Tutorial: Linear Block Codes
- Lecture 16 - Linear Block Codes: Error Detection
- Lecture 17 - Linear Block Codes: Error Correction
- Lecture 18 - Examples of Linear Block Codes
- Lecture 19 - Introduction to Convolution Codes
- Lecture 20 - Convolution Code: Decoder-Viterbi Algorithm
- Lecture 21 - Tutorial 3 - MATLAB Tutorial: Syndrome Identification and Correction
- Lecture 22 - Convolution Codes: State Diagram and Transfer Function
- Lecture 23 - Turbo codes
- Lecture 24 - Low Density Parity Check (LDPC) Codes: Encoding
- Lecture 25 - Low Density Parity Check (LDPC) Codes: Decoding
- Lecture 26 - Introduction to Polar Codes
- Lecture 27 - Polar Codes: Encoding and Decoding
- Lecture 28 - Introduction to MIMO systems
- Lecture 29 - Spatial Diversity Techniques

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

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- Lecture 30 - Introduction to Space Time Block Codes
- Lecture 31 - Tutorial 4 - Convolution Codes: Hard and Soft Decoding
- Lecture 32 - MIMO Zero-Forcing Receiver
- Lecture 33 - MIMO MMSE Receiver
- Lecture 34 - Introduction to MIMO SVD
- Lecture 35 - Diagonalization of MIMO channel
- Lecture 36 - Optimal Capacity of MIMO channel and MIMO Beamforming
- Lecture 37 - Tutorial 5 - Random Access Technoques: ALOHA and CSMA
- Lecture 38 - MIMO V-BLAST Receivers
- Lecture 39 - Introduction to Adaptive Modulation and Coding
- Lecture 40 - Modulation and Coding with Variable MQAM
- Lecture 41 - Conventional Multiple Access Schemes
- Lecture 42 - Next generation Multiple Access Schemes and Multi-User Channels
- Lecture 43 - Overview of Cellular and Wi-Fi Standards
- Lecture 44 - Evolution of Cellular and Wi-Fi Standards
- Lecture 45 - Tutorial 6 - MIMO SVD Example
- Lecture 46 - Tutorial 7 - Rate Splitting Multiple Access

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

NPTEL Video Course - Electrical Engineering - NOC:State Space Approach to Control System Analysis and Design

Subject Co-ordinator - Prof A P Tiwari

Co-ordinating Institute - IIT - Mandi

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

Lecture 1 - Introduction

Lecture 2 - Standard State-space Representation of Physical Systems

Lecture 3 - Mathematical Modeling from First Principles

Lecture 4 - Mathematical Modeling from First Principles

Lecture 5 - State-space Representation of Transfer Functions

Lecture 6 - State-space Representation of Transfer Functions (Continued...)

Lecture 7 - Equivalent Dynamical Equations

Lecture 8 - Transformation of State Equations into Canonical forms

Lecture 9 - Solution of State Equations

Lecture 10 - Solution of State Equations: Methods to determine the STM

Lecture 11 - Simulation: An Overview

Lecture 12 - Numerical Solution of State Equations

Lecture 13 - Controllability

Lecture 14 - Controllability

Lecture 15 - Controllability

Lecture 16 - Observability

Lecture 17 - Lypunov's Stability - 1

Lecture 18 - Lypunov's Stability - 2

Lecture 19 - Lypunov's Stability - 3

Lecture 20 - Pole Placement Design-I: Concept of State feedback

Lecture 21 - Pole Placement Design-II: Properties of State Feedback

Lecture 22 - Pole Placement Design-III: Pole placement formulae, Selection of Closed loop pole locations

Lecture 23 - Linear Quadratic Optimal Control - Part 1

Lecture 24 - Linear Quadratic Optimal Control - Part 2

Lecture 25 - Linear Observers-Full Order Observer

Lecture 26 - Linear Observers-Reduced Order Observer

Lecture 27 - Separation Principle

Lecture 28 - Multirate Sampling Controllers-Relationship between System state, multirate output samples and i

Lecture 29 - Multirate Output Controller (MROC)

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

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- Lecture 30 - Fast Output Sampling (FOS) Controller
- Lecture 31 - Periodic Output Feedback (POF) Controller
- Lecture 32 - Continuous-Time Kalman Filter
- Lecture 33 - Discrete-Time Kalman Filter
- Lecture 34 - Case Study of Nuclear Reactor: Nonlinear Model Development
- Lecture 35 - Case Study of Nuclear Reactor: Model Linearization
- Lecture 36 - Case Study of Nuclear Reactor: Output Feedback Control Design
- Lecture 37 - Case Study of Nuclear Reactor: Periodic Output Feedback Design
- Lecture 38 - Case Study of Nuclear Reactor: Fast Output Sampling based Control Design
- Lecture 39 - Case Study of Nuclear Reactor: Application of Kalman Filtering to Response Improvement of Vanadi

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

NPTEL Video Course - Electrical Engineering - NOC:Optimization Theory and Algorithms

Subject Co-ordinator - Prof. Uday K Khankhoje

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to the course - 1 - Prerequisites, key elements
- Lecture 2 - Introduction to the course - 2 - Types of problems
- Lecture 3 - Introduction to the course - 3 - An optimization example to live longer
- Lecture 4 - Summary of background material - Linear Algebra - I
- Lecture 5 - Summary of background material - Linear Algebra - II
- Lecture 6 - Summary of background material - Analysis - I
- Lecture 7 - Summary of background material - Analysis - II
- Lecture 8 - Summary of background material - Analysis - III
- Lecture 9 - Summary of background material - Calculus - I
- Lecture 10 - Summary of background material - Calculus - II
- Lecture 11 - Summary of background material - Calculus - III
- Lecture 12 - Example of Multivariate Differentiation
- Lecture 13 - Gradient of Quadratic form and product rule
- Lecture 14 - Directional derivative, hessian, and mean value theorem
- Lecture 15 - Unconstrained optimization - 1 - Roadmap of the course and Taylor's theorem
- Lecture 16 - Unconstrained optimization - 2 - Identifying a local minima - 1st and 2nd order conditions
- Lecture 17 - Unconstrained optimization - 3 - Proof of 1st Order Condition
- Lecture 18 - Unconstrained optimization - 4 - overview of algorithms and choosing a descent direction
- Lecture 19 - Unconstrained optimization - 5 - properties of descent directions steepest descent direction
- Lecture 20 - Unconstrained optimization - 6 - properties of descent directions newton direction
- Lecture 21 - Unconstrained optimization - 7 - Trust Region Methods
- Lecture 22 - A MATLAB session
- Lecture 23 - Introduction to Line Search
- Lecture 24 - Wolfe Conditions
- Lecture 25 - Strong Wolfe Conditions
- Lecture 26 - Backtracking Line Search
- Lecture 27 - Line Search - Analysis
- Lecture 28 - Line Search - Convergence and Rate - 1
- Lecture 29 - Line Search - Convergence and Rate - 2

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

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- Lecture 30 - Convergence analysis of a descent algorithm - 1
- Lecture 31 - Convergence analysis of a descent algorithm - 2
- Lecture 32 - Implementation of an optimization algorithm in MATLAB
- Lecture 33 - Conjugate Gradient Methods - Introduction and Proof
- Lecture 34 - Visualizing Quadratic Forms
- Lecture 35 - Orthogonality and Conjugacy
- Lecture 36 - Conjugate Directions Method - Introduction and Proof
- Lecture 37 - Discussion on doubts
- Lecture 38 - More on Conjugate Directions Method
- Lecture 39 - Ways of Generating Conjugate Directions
- Lecture 40 - Expanding Subspace Theorem
- Lecture 41 - Discussion on doubts
- Lecture 42 - Conjugate Gradient Method
- Lecture 43 - MATLAB implementation on CGM
- Lecture 44 - Discussion on doubts
- Lecture 45 - Preconditioned Conjugate Gradient - Part 1
- Lecture 46 - Preconditioned Conjugate Gradient - Part 2
- Lecture 47 - Preconditioned Conjugate Gradient - Part 3
- Lecture 48 - Non Linear Conjugate Gradient method
- Lecture 49 - Intro to Newton methods
- Lecture 50 - Newton methods and convergence
- Lecture 51 - Checks for positive definite matrices
- Lecture 52 - Hessian Modification
- Lecture 53 - Quasi newton methods
- Lecture 54 - BFGS method
- Lecture 55 - Least squares problems
- Lecture 56 - Linear least squares - Part 1
- Lecture 57 - Linear least squares - Part 2
- Lecture 58 - Solving least squares using SVD
- Lecture 59 - Non linear least squares
- Lecture 60 - Constrained Optimisation
- Lecture 61 - Single equality constraint
- Lecture 62 - Single inequality constraint - Part 1
- Lecture 63 - Single inequality constraint - Part 2
- Lecture 64 - Two inequality constraints example
- Lecture 65 - Linearised feasible directions
- Lecture 66 - Feasible sequences and tangent cone
- Lecture 67 - LICQ conditions
- Lecture 68 - KKT conditions (First order necessary conditions)

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

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- Lecture 69 - Proof sketch for KKT conditions - Part 1
- Lecture 70 - Proof sketch for KKT conditions - Part 2
- Lecture 71 - Introduction to Projected gradient descent
- Lecture 72 - Projected gradient descent and proof of convergence
- Lecture 73 - Proof of convergence - Part 2
- Lecture 74 - Subgradients and Subdifferential
- Lecture 75 - Projection onto  $l_1$  ball
- Lecture 76 - Soft thresholding example
- Lecture 77 - Recap of Projection onto  $l_1$  ball
- Lecture 78 - KKT and duality introduction
- Lecture 79 - Intuition of duality and dual problem
- Lecture 80 - Proof of concavity of the dual problem - Part 1
- Lecture 81 - Proof of concavity of the dual problem - Part 2
- Lecture 82 - Proof of concavity of the dual problem - Part 3

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

NPTEL Video Course - Electrical Engineering - NOC:Power Electronics with Wide Band Gap Devices

Subject Co-ordinator - Prof. Moumita Das

Co-ordinating Institute - IIT - Mandi

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

- Lecture 1 - Introduction Wide Bandgap Devices
- Lecture 2 - Characterization Of Wide Bandgap Devices
- Lecture 3 - Static Characterization Of Power Devices
- Lecture 4 - Junction Capacitance Characterization Of Power Devices
- Lecture 5 - Fundamentals Of Dynamic Characterization
- Lecture 6 - Fundamentals Of Dynamic Characterization (Continued...)
- Lecture 7 - Gate Drive For Dynamic Characterization
- Lecture 8 - Gate Drive For Dynamic Characterization (Continued...)
- Lecture 9 - Gate Drive For Dynamic Characterization (Continued...)
- Lecture 10 - Gate Driver Protection
- Lecture 11 - Dpt-Protection
- Lecture 12 - Protection-Dpt
- Lecture 13 - Cross Talk Consideration
- Lecture 14 - Cross Talk Consideration (Continued...)
- Lecture 15 - Layout Design And Parasitic Management
- Lecture 16 - Layout Design And Parasitic Management (Continued...)
- Lecture 17 - Layout
- Lecture 18 - Heat Sink
- Lecture 19 - Heat Sink (Continued...)
- Lecture 20 - Electromagnetic Interference (EMI) - Part 1
- Lecture 21 - Electromagnetic Interference (EMI) - Part 2
- Lecture 22 - Electromagnetic Interference (EMI) - Part 3
- Lecture 23 - Electromagnetic Interference (EMI) - Passive Filter
- Lecture 24 - Electromagnetic Interference (EMI) - Active Filter
- Lecture 25 - Getting Started With Ltspice
- Lecture 26 - Getting Started With Ltspice - Part 1
- Lecture 27 - Getting Started With Ltspice - Part 2
- Lecture 28 - EMI Simulation with LTspice - Part 1
- Lecture 29 - EMI Simulation with LTspice - Part 2

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

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- Lecture 30 - Power Density - Part 1
- Lecture 31 - Power Density - Part 2
- Lecture 32 - Introduction to PCB Design
- Lecture 33 - PCB Design
- Lecture 34 - WBG Applications - IMD
- Lecture 35 - WBG Applications - Renewable Energy Sources
- Lecture 36 - WBG Applications - Reliability Analysis



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

NPTEL Video Course - Electrical Engineering - NOC:Optimal Control

Subject Co-ordinator - Prof. Barjeev Tyagi

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction and Performance Index
- Lecture 2 - Basic Concepts of Calculus of Variation
- Lecture 3 - The Basic Variational Problem
- Lecture 4 - Fixed End Point Problem
- Lecture 5 - Free End Point Problem
- Lecture 6 - Free End Point Problem (Continued...)
- Lecture 7 - Free End Point Problem (Continued...)
- Lecture 8 - Free End Point Problem (Continued...)
- Lecture 9 - Optimum of Functions with Conditions
- Lecture 10 - Optimum of Functions with Conditions (Lagrange Multiplier Method)
- Lecture 11 - Optimum of Functional with Conditions
- Lecture 12 - Variational Approach to Optimal Control Systems
- Lecture 13 - Variational Approach to Optimal Control Systems (Continued...)
- Lecture 14 - Linear Quadratic Optimal Control Systems
- Lecture 15 - Linear Quadratic Optimal Control Systems (Continued...)
- Lecture 16 - Linear Quadratic Optimal Control Systems (Continued...)
- Lecture 17 - Linear Quadratic Optimal Control Systems (Continued...)
- Lecture 18 - Linear Quadratic Optimal Control Systems (Continued...)
- Lecture 19 - Linear Quadratic Optimal Control Systems (Optimal Value of Performance Index)
- Lecture 20 - Infinite Horizon Regulator Problem
- Lecture 21 - Infinite Horizon Regulator Problem (Continued...)
- Lecture 22 - Analytical Solution of MDRE - State Transition Matrix Approach
- Lecture 23 - Analytical Solution of MDRE - Similarity Transformation Approach
- Lecture 24 - Analytical Solution of MDRE - Similarity Transformation Approach (Continued...)
- Lecture 25 - Frequency Domain Interpretation of LQR - Linear Time Invariant System
- Lecture 26 - Frequency Domain Interpretation of LQR - Linear Time Invariant System (Continued...)
- Lecture 27 - LQR with a Specified Degree of Stability
- Lecture 28 - Inverse Matrix Riccati Equation
- Lecture 29 - Linear Quadratic Tracking System

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

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- Lecture 30 - Discrete-Time Optimal Control Systems
- Lecture 31 - Discrete-Time Optimal Control Systems (Continued...)
- Lecture 32 - Discrete-Time Optimal Control Systems (Continued...)
- Lecture 33 - Matrix Discrete Riccati Equation
- Lecture 34 - Analytical Solution of Matrix Difference Riccati Equation
- Lecture 35 - Analytical Solution of Matrix Difference Riccati Equation (Continued...)
- Lecture 36 - Optimal Control using Dynamic Programming
- Lecture 37 - The Hamilton-Jacobi-Bellman (HJB) Equation
- Lecture 38 - LQR System Using HJB Equation
- Lecture 39 - Time Optimal Control System - Constrained Input
- Lecture 40 - Time Optimal Control System (Continued...)

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

NPTEL Video Course - Electronics and Communication Engineering - NOC:Basics of Software Defined Radios and Pr

Subject Co-ordinator - Dr. Meenakshi Rawat

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Foundation for software defined radio

Lecture 2 - Components of a software defined radio

Lecture 3 - Software defined radio architectures - Part I

Lecture 4 - Software defined radio architectures - Part II

Lecture 5 - Software defined radio architectures - Part III

Lecture 6 - Software defined radio architectures - Part IV

Lecture 7 - Distortion Parameters - Part I

Lecture 8 - Distortion Parameters - Part II

Lecture 9 - Distortion Parameters

Lecture 10 - Distortion Parameters

Lecture 11 - Power Amplifiers

Lecture 12 - Power Amplifiers

Lecture 13 - Case study-I

Lecture 14 - Case study-II

Lecture 15 - Behavioral models for representing nonlinear distortions

Lecture 16 - Linearization Techniques for nonlinear distortion

Lecture 17 - Predistortion Techniques for nonlinearity distortion in SDR

Lecture 18 - Basic Digital Predistortion Techniques for nonlinear distortion in SDR

Lecture 19 - State-of-the-art Digital Predistortion Techniques for Nonlinear Distortion in SDR

Lecture 20 - Digital Predistortion Techniques for Linear as well as Nonlinear Distortion in SDR

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

NPTEL Video Course - Electrical Engineering - NOC:Electrical Distribution System Analysis

Subject Co-ordinator - Prof. N P Padhy, Late Prof. G. B. Kumbhar

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to Electrical Distribution System
- Lecture 2 - Components of Distribution System Substation and Busbar Layouts
- Lecture 3 - Components of Distribution System and Feeder Configurations
- Lecture 4 - Nature of Loads in a Distribution System
- Lecture 5 - Load Allocation in a Distribution System
- Lecture 6 - K Factors and Their Applications
- Lecture 7 - Analysis of Uniformly Distributed Loads
- Lecture 8 - Lumping Loads in Geometric Configurations: Rectangular
- Lecture 9 - Lumping Loads in Geometric Configurations: Triangular
- Lecture 10 - Impedance of Distribution Lines and Feeders - Part I
- Lecture 11 - Series Impedance of Distribution Lines and Feeders - Part II
- Lecture 12 - Models of Distribution Lines and Cables
- Lecture 13 - Modelling of Single-Phase and Three-Phase Transformers
- Lecture 14 - Modelling of Three-Phase Transformers - Part I
- Lecture 15 - Modelling of Three-Phase Transformers - Part II
- Lecture 16 - Modelling of Three-Phase Transformers - Part III
- Lecture 17 - Modelling of Three-Phase Transformers - Part IV
- Lecture 18 - Modelling of Step Voltage Regulators - Part I
- Lecture 19 - Modelling of Step Voltage Regulators - Part II
- Lecture 20 - Modelling of Step Voltage Regulators - Part III
- Lecture 21 - Modelling of Step Voltage Regulators - Part IV
- Lecture 22 - Load Models in Distribution System - Part I
- Lecture 23 - Load Models in Distribution System - Part II
- Lecture 24 - Modelling of Distributed Generation
- Lecture 25 - Applications and Modeling of Capacitor Banks
- Lecture 26 - Summary of Modelling of Distribution System Components
- Lecture 27 - Backward/Forward Sweep Load Flow Analysis - Part I
- Lecture 28 - Backward/Forward Sweep Load Flow Analysis - Part II
- Lecture 29 - Direct Approach Based Load Flow Analysis - Part I

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

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- Lecture 30 - Direct Approach Based Load Flow Analysis - Part II
- Lecture 31 - Direct Approach Based Load Flow Analysis - Part III
- Lecture 32 - Direct Approach Based Load Flow Analysis: Weakly Meshed System
- Lecture 33 - Gauss Implicit Z-matrix Method
- Lecture 34 - Sequence Component Based Short Circuit Analysis
- Lecture 35 - Thevenin's Equivalent and Phase Variable Based Short Circuit Analysis
- Lecture 36 - Direct Approach for Short-Circuit Analysis: Introduction and LG Fault
- Lecture 37 - Direct Approach for Short-Circuit Analysis: LLG and LLLG Fault
- Lecture 38 - Direct Approach for Short-Circuit Analysis: LL Fault and Examples
- Lecture 39 - Direct Approach for Short-Circuit Analysis: Weakly Meshed System
- Lecture 40 - Applications of Distribution System Analysis
- Lecture 41 - Distributed Generation Integration Issues in Distribution System
- Lecture 42 - Distribution System Protection Issues
- Lecture 43 - Power Quality, Reliability and Availability
- Lecture 44 - Design and Operation - Part I
- Lecture 45 - Design and Operation - Part II
- Lecture 46 - Definition and objective of Volt-var control (VVC)
- Lecture 47 - Traditional approaches of VVC
- Lecture 48 - Distribution Automation
- Lecture 49 - SCADA-Based VVC and Integrated VVC
- Lecture 50 - Advanced technologies for VVC - Part I
- Lecture 51 - Advanced technologies for VVC - Part II
- Lecture 52 - System Planning - Part I
- Lecture 53 - System Planning - Part II
- Lecture 54 - Electricity Forecasting
- Lecture 55 - Case study: IIT Roorkee distribution system
- Lecture 56 - Optimization techniques
- Lecture 57 - Optimal location and sizing battery energy storage system (BESS)
- Lecture 58 - Practical Insights into Electrical Distribution Systems
- Lecture 59 - Field Deployment of BESS
- Lecture 60 - Emerging Technologies and Future Trends

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

NPTEL Video Course - Electrical Engineering - NOC:Introduction to Smart Grid

Subject Co-ordinator - Prof. Premalata Jena, Prof. N.P. Padhy

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction to Smart Grid - I  
Lecture 2 - Introduction to Smart Grid - II  
Lecture 3 - Architecture of smart grid system  
Lecture 4 - Standards for smart grid system  
Lecture 5 - Elements and Technologies of smart grid system - I  
Lecture 6 - Elements and Technologies of smart grid system - II  
Lecture 7 - Distributed Generation Resources - I  
Lecture 8 - Distributed Generation Resources - II  
Lecture 9 - Distributed Generation Resources - III  
Lecture 10 - Distributed Generation Resources - IV  
Lecture 11 - Wide Area Monitoring System - I  
Lecture 12 - Wide Area Monitoring System - II  
Lecture 13 - Phasor Estimation - I  
Lecture 14 - Phasor Estimation - II  
Lecture 15 - Digital Relays for Smart Grid Protection  
Lecture 16 - Islanding Detection Techniques - I  
Lecture 17 - Islanding Detection Techniques - II  
Lecture 18 - Islanding Detection Techniques - III  
Lecture 19 - Smart Grid Protection - I  
Lecture 20 - Smart Grid Protection - II  
Lecture 21 - Smart Grid Protection - III  
Lecture 22 - Smart Grid Protection - IV  
Lecture 23 - Modelling of Storage Devices  
Lecture 24 - Modelling of DC Smart Grid Components  
Lecture 25 - Operation and Control of AC Microgrid - I  
Lecture 26 - Operation and Control of AC Microgrid - II  
Lecture 27 - Operation and Control of DC Microgrid - I  
Lecture 28 - Operation and Control of DC Microgrid - II  
Lecture 29 - Operation and Control of AC-DC hybrid Microgrid - I

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

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- Lecture 30 - Operation and Control of AC-DC hybrid Microgrid - II
- Lecture 31 - Simulation and Case Study of AC Microgrid
- Lecture 32 - Simulation and Case Study of DC Microgrid
- Lecture 33 - Simulation and Case Study of AC-DC Hybrid Microgrid
- Lecture 34 - Demand Side Management in Smart Grid
- Lecture 35 - Demand Response Analysis of Smart Grid
- Lecture 36 - Energy Management
- Lecture 37 - Design of Smart Grid and Practical Smart Grid Case Study - I
- Lecture 38 - Design of Smart Grid and Practical Smart Grid Case Study - II
- Lecture 39 - System Analysis of AC/DC Smart Grid
- Lecture 40 - Conclusions

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

NPTEL Video Course - Electrical Engineering - NOC:Facts Devices

Subject Co-ordinator - Prof. Avik Bhattacharya

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction - I  
Lecture 2 - Introduction - II  
Lecture 3 - Switch Realization  
Lecture 4 - PWM - I  
Lecture 5 - PWM - II  
Lecture 6 - Closed Loop Control  
Lecture 7 - Multi Level Inverter - I  
Lecture 8 - Multi Level Inverter - II  
Lecture 9 - Multi Level Inverter - III  
Lecture 10 - Shunt Compensator Analysis  
Lecture 11 - Shunt Compensator TCR and TSC - I  
Lecture 12 - Shunt Compensator TCR and TSC - II  
Lecture 13 - Static Var Compensator - I  
Lecture 14 - Static Var Compensator - II  
Lecture 15 - STATCOM - I  
Lecture 16 - STATCOM - II  
Lecture 17 - STATCOM/SVC Comparisons  
Lecture 18 - External Control Design of Static Var Compensator  
Lecture 19 - DSTATCOM  
Lecture 20 - Design of DSTATCOM  
Lecture 21 - Series Compensator - I  
Lecture 22 - Series Compensator - II  
Lecture 23 - GCSC and SSSC  
Lecture 24 - SSSC - II  
Lecture 25 - SSSC - III and TSSC  
Lecture 26 - TSSC - II and TCSC  
Lecture 27 - TCSC Characteristics and Control  
Lecture 28 - Voltage and Phase Angle Regulation  
Lecture 29 - Voltage and Phase Angle Regulator Device - I

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

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- Lecture 30 - Voltage and Phase Angle Regulator Device - II
- Lecture 31 - UPQC Introduction and Classification
- Lecture 32 - UPQC Classification - I
- Lecture 33 - Operation and Control of UPQC - II
- Lecture 34 - Operation and Control of UPQC - III
- Lecture 35 - UPFC
- Lecture 36 - Control Structure of UPFC
- Lecture 37 - Comparison of UPFC with PAR and Series Compensators
- Lecture 38 - Interline Power Flow Controller (IPFC) - I
- Lecture 39 - Interline Power Flow Controller (IPFC) - II
- Lecture 40 - Practical Application and Conclusion

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

NPTEL Video Course - Electrical Engineering - NOC:Advanced Linear Continuous Control Systems: Applications wi

Subject Co-ordinator - Prof. Yogesh Vijay Hote

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to State Space
- Lecture 2 - State Space Representation
- Lecture 3 - State Space Representation
- Lecture 4 - State Space Representation
- Lecture 5 - State Space Representation
- Lecture 6 - State Space Representation
- Lecture 7 - State Space Representation
- Lecture 8 - State Space Representation
- Lecture 9 - State Space Representation
- Lecture 10 - State Space Representation
- Lecture 11 - Modelling of Mechanical Systems in State Space
- Lecture 12 - Modelling of DC Servo Motor - Part I
- Lecture 13 - Modelling of DC Servo Motor - Part II
- Lecture 14 - Determination of Transfer Function from State Space Model - Part I
- Lecture 15 - Determination of Transfer Function from State Space Model - Part II
- Lecture 16 - Stability Analysis in State Space
- Lecture 17 - Stability Analysis in State Space - Part II
- Lecture 18 - Stability Analysis in State Space
- Lecture 19 - Stability Analysis in State Space
- Lecture 20 - Stability Analysis in State Space
- Lecture 21 - Concept of Diagonalization
- Lecture 22 - Solution of State Equation
- Lecture 23 - Solution of State Equation (Forced System)
- Lecture 24 - Steady State Error for State Space System
- Lecture 25 - State Transition Matrix - Part I
- Lecture 26 - State Transition Matrix - Part II
- Lecture 27 - State Transition Matrix using Cayley-Hamilton Theorem - Part III
- Lecture 28 - MATLAB Programming with State Space
- Lecture 29 - Controllability in State Space - Part I

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

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- Lecture 30 - Controllability in State Space - Part II
- Lecture 31 - Observability in State Space - Part I
- Lecture 32 - Observability in State Space - Part II
- Lecture 33 - Pole Placement by State Feedback - Part I
- Lecture 34 - Pole Placement by State Feedback - Part II
- Lecture 35 - Pole Placement by State Feedback - Part III
- Lecture 36 - Tracking Problem in State Feedback Design - Part I
- Lecture 37 - Tracking Problem in State Feedback Design - Part II
- Lecture 38 - State Observer Design - Part I
- Lecture 39 - State Observer Design - Part II
- Lecture 40 - State Observer Design - Part III

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

NPTEL Video Course - Electrical Engineering - NOC:Computer Aided Power System Analysis

Subject Co-ordinator - Prof. Biswarup Das

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Modeling of Power System Components
- Lecture 2 - Modeling of Power System Components (Continued...)
- Lecture 3 - Bus Admittance Matrix
- Lecture 4 - Bus Admittance Matrix with Mutual Impedance
- Lecture 5 - Bus Admittance Matrix with mutual impedance (Continued...)
- Lecture 6 - Power flow equations and classification of buses
- Lecture 7 - Basic Gauss - Seidel Numerical Method
- Lecture 8 - Gauss - Seidel Load Flow (GSLF)
- Lecture 9 - GSLF with Multiple Generators
- Lecture 10 - Example of GSLF
- Lecture 11 - Basics of Newton Raphson Numerical Method
- Lecture 12 - Newton - Raphson Load Flow (NRLF) in Polar Co-Ordinate
- Lecture 13 - NRLF in polar co-ordinate (Continued...)
- Lecture 14 - NRLF in polar co-ordinate (Continued...)
- Lecture 15 - NRLF (Polar) Algorithm and Example
- Lecture 16 - NRLF in rectangular coordinate
- Lecture 17 - NRLF in rectangular coordinate (Continued...)
- Lecture 18 - NRLF in rectangular coordinate (Continued...)
- Lecture 19 - Example of NRLF (Rectangular) Method
- Lecture 20 - Fast decoupled load flow (FDLF)
- Lecture 21 - FDLF (Continued...)
- Lecture 22 - FDLF (Continued...)
- Lecture 23 - AC- DC Load Flow
- Lecture 24 - AC- DC Load Flow (Continued...)
- Lecture 25 - AC- DC Load Flow (Continued...)
- Lecture 26 - Sparsity and Gaussian Elimination
- Lecture 27 - Gaussian Elimination Method
- Lecture 28 - Example of Gaussian Elimination Method
- Lecture 29 - Gaussian Elimination and Optimal Ordering

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

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- Lecture 30 - Triangular Factorization
- Lecture 31 - LU Decomposition
- Lecture 32 - Introduction to Contingency Analysis
- Lecture 33 - Linear Sensitivity Factor
- Lecture 34 - Linear Sensitivity Factors (Continued...)
- Lecture 35 - Line outage sensitivity factor
- Lecture 36 - Line outage sensitivity factor (Continued...)
- Lecture 37 - Line outage sensitivity factor (Continued...)
- Lecture 38 - State Estimation Technique
- Lecture 39 - Weighted Least Square (WLS) Method
- Lecture 40 - WLS (Continued...)
- Lecture 41 - WLS Examples
- Lecture 42 - Error Analysis
- Lecture 43 - Error Analysis (Continued...)
- Lecture 44 - Bad Data Detection
- Lecture 45 - Power system state estimation
- Lecture 46 - Power system state estimation (Continued...)
- Lecture 47 - Power system state estimation (Continued...)
- Lecture 48 - Power system state estimation (Continued...)
- Lecture 49 - Fault Analysis
- Lecture 50 - Fault Analysis (Continued...)
- Lecture 51 - Fault Analysis (Continued...)
- Lecture 52 - Fault Analysis (Continued...)
- Lecture 53 - Fault Analysis (Continued...)
- Lecture 54 - Fault Analysis (Continued...)
- Lecture 55 - Fault Analysis (Continued...)
- Lecture 56 - Fault Analysis (Continued...)
- Lecture 57 - Fault Analysis (Continued...)
- Lecture 58 - Fault Analysis (Continued...)
- Lecture 59 - Fault Analysis (Continued...)
- Lecture 60 - Fault Analysis (Continued...)

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

NPTEL Video Course - Electrical Engineering - NOC:Advance Power Electronics and Control

Subject Co-ordinator - Prof. Avik Bhattacharya

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction  
Lecture 2 - Basic Concept of Switches  
Lecture 3 - Device Physics - I  
Lecture 4 - Device Physics - II  
Lecture 5 - Device Physics - III  
Lecture 6 - Device Physics - IV  
Lecture 7 - Application and Analysis of Switches - I  
Lecture 8 - Application and Analysis of Switches - II  
Lecture 9 - Single Phase Converter  
Lecture 10 - Single Phase Converters - II  
Lecture 11 - Single Phase Converters - III  
Lecture 12 - Three Phase Converters - I  
Lecture 13 - Three Phase Converters - II  
Lecture 14 - Multipulse Converters II  
Lecture 15 - Effect of Source Inductance and PWM Rectifiers  
Lecture 16 - PWM Rectifiers - II  
Lecture 17 - PWM Rectifiers - III and Power Factor Improvement Techniques  
Lecture 18 - PWM Rectifiers - IV and Power Factor Improvement Techniques - II  
Lecture 19 - Power Factor Improvement Techniques III and Non Isolated DC- DC Converters  
Lecture 20 - Non Isolated DC- DC Converters - II  
Lecture 21 - Non Isolated and Isolated DC- DC Converters and Choppers  
Lecture 22 - Isolated DC-DC Converters and Choppers  
Lecture 23 - Isolated DC-DC Converters - II  
Lecture 24 - Isolated DC-DC Converters - III  
Lecture 25 - Isolated DC-DC Converters - IV and VSI and CSI  
Lecture 26 - VSI and CSI  
Lecture 27 - VSI and CSI II and MLI  
Lecture 28 - PWM Techniques II and MLI  
Lecture 29 - MLI II and ZSI

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

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- Lecture 30 - ZSI II and Space Vector Modulation (SVM)
- Lecture 31 - SVM II and AC to AC Converters
- Lecture 32 - SVM III and AC to AC Converters
- Lecture 33 - Cycloconverters and Matrix Converters
- Lecture 34 - Matrix Converter - II
- Lecture 35 - Matrix Converter - III and Power Quality Mitigation Devices
- Lecture 36 - Power Quality Mitigation Devices - II
- Lecture 37 - Linear and Non Linear Control in Power Electronics - I
- Lecture 38 - Linear and Non Linear Control in Power Electronics - II
- Lecture 39 - Non-Linear Control in Power Electronics
- Lecture 40 - Application and Conclusion

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

NPTEL Video Course - Electrical Engineering - NOC:CMOS Digital VLSI Design

Subject Co-ordinator - Prof. Sudeb Dasgupta

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - MOS Transistor Basics - I  
Lecture 2 - MOS Transistor Basics - II  
Lecture 3 - MOS Transistor Basics - III  
Lecture 4 - MOS Parasitics and SPICE Model  
Lecture 5 - CMOS Inverter Basics - I  
Lecture 6 - CMOS Inverter Basics - II  
Lecture 7 - CMOS Inverter Basics - III  
Lecture 8 - Power Analysis - I  
Lecture 9 - Power Analysis - II  
Lecture 10 - SPICE Simulation - I  
Lecture 11 - SPICE Simulation - II  
Lecture 12 - Combinational Logic Design - I  
Lecture 13 - Combinational Logic Design - II  
Lecture 14 - Combinational Logic Design - III  
Lecture 15 - Combinational Logic Design - IV  
Lecture 16 - Combinational Logic Design - V  
Lecture 17 - Combinational Logic Design - VI  
Lecture 18 - Combinational Logic Design - VII  
Lecture 19 - Combinational Logic Design - VIII  
Lecture 20 - Combinational Logic Design - IX  
Lecture 21 - Combinational Logic Design - X  
Lecture 22 - Logical Efforts - I  
Lecture 23 - Logical Efforts - II  
Lecture 24 - Logical Efforts - III  
Lecture 25 - Sequential Logic Design - I  
Lecture 26 - Sequential Logic Design - II  
Lecture 27 - Sequential Logic Design - III  
Lecture 28 - Sequential Logic Design - IV  
Lecture 29 - Sequential Logic Design - V

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

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- Lecture 30 - Sequential Logic Design - VI
- Lecture 31 - Sequential Logic Design - VII
- Lecture 32 - Sequential Logic Design - VIII
- Lecture 33 - Clocking Strategies for Sequential Design - I
- Lecture 34 - Clocking Strategies for Sequential Design - II
- Lecture 35 - Clocking Strategies for Sequential Design - III
- Lecture 36 - Clocking Strategies for Sequential Design - IV
- Lecture 37 - Sequential Logic Design - IX
- Lecture 38 - Clocking Strategies for Sequential Design - V
- Lecture 39 - Concept of Memory and its Designing - I
- Lecture 40 - Concept of Memory and its Designing - II

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

NPTEL Video Course - Electrical Engineering - NOC:Microelectronics: Devices to Circuits

Subject Co-ordinator - Prof. Sudeb Dasgupta

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Bipolar Junction Transistor  
Lecture 2 - Bipolar Junction Transistor  
Lecture 3 - Bipolar Junction Transistor  
Lecture 4 - BJT Operation in active mode Circuit symbol and conventions - I  
Lecture 5 - BJT Operation in active mode Circuit symbol and conventions - II  
Lecture 6 - BJT as an amplifier small circuit model - I  
Lecture 7 - BJT as an amplifier small circuit model - II  
Lecture 8 - BJT Small Signal Circuit Model - I  
Lecture 9 - BJT Small Signal Circuit Model - II  
Lecture 10 - BJT as a switch and Ebers Moll Model  
Lecture 11 - Simple BJT Inverter and second order effects  
Lecture 12 - BJT Second order effects - I  
Lecture 13 - BJT Second order effects - II  
Lecture 14 - MOS Transistor basics - I  
Lecture 15 - MOS Transistor basics - II  
Lecture 16 - MOS Transistor basics - III  
Lecture 17 - MOS Parasitic and SPICE Model  
Lecture 18 - CMOS Inverter Basics - I  
Lecture 19 - CMOS Inverter Basics - II  
Lecture 20 - CMOS Inverter Basics - III  
Lecture 21 - Power Analysis - I  
Lecture 22 - Logical Efforts - I  
Lecture 23 - Fabrication-Process - I  
Lecture 24 - Fabrication-Process - II  
Lecture 25 - Biasing of Amplifier and its behaviour as an Analog switch - I  
Lecture 26 - Biasing of Amplifier and its behaviour as an Analog switch - II  
Lecture 27 - Biasing of Amplifier and its behaviour as an Analog switch - III  
Lecture 28 - CMOS CS/CG/CD Amplifier Configuration  
Lecture 29 - CMOS CG/CD Amplifier Configuration

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

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- Lecture 30 - Internal CAP Models and high frequency Modelling - I
- Lecture 31 - Internal CAP Models and high frequency Modelling - II
- Lecture 32 - JFET, Structure and Operation
- Lecture 33 - Multistage and Differential Amplifier - I
- Lecture 34 - Multistage and Differential Amplifier - II
- Lecture 35 - MOS Differential Amplifier - I
- Lecture 36 - MOS Differential Amplifier - II
- Lecture 37 - Small signal operation and Differential Amplifiers - I
- Lecture 38 - Small signal operation and Differential Amplifiers - II
- Lecture 39 - Multistage Amplifier with SPICE Simulation
- Lecture 40 - S-Domain Analysis, Transfer Function, Poles and Zeros - I
- Lecture 41 - S-Domain Analysis, Transfer Function, Poles and Zeros - II
- Lecture 42 - High Frequency response of CS and CE Amplifier
- Lecture 43 - High Frequency response of CC and SF Configuration
- Lecture 44 - Frequency response of Differential Amplifier
- Lecture 45 - General Feedback Structure and properties of negative Feedback
- Lecture 46 - Basic Feedback Topologies
- Lecture 47 - Design of feedback amplifier for all configuration
- Lecture 48 - Stability and amplifier poles
- Lecture 49 - Bode plots and Frequency Plot
- Lecture 50 - Ideal Operational Amplifier and its terminal
- Lecture 51 - Op-amp as a Integrator and Differentiator
- Lecture 52 - Large Signal Operation of Op-amp and second order effects
- Lecture 53 - Combinational logic design - I
- Lecture 54 - Combinational logic design - II
- Lecture 55 - Combinational logic design - III
- Lecture 56 - Combinational logic design - IV
- Lecture 57 - Sequential logic design - I
- Lecture 58 - Clocking strategies For Sequential design - I
- Lecture 59 - Clocking strategies For Sequential design - II
- Lecture 60 - Memory Design

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

NPTEL Video Course - Electrical Engineering - NOC:DC Microgrid

Subject Co-ordinator - Prof. Avik Bhattacharya

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Overview of Microgrids
- Lecture 2 - Concept of Microgrids
- Lecture 3 - Microgrid and distributed generation
- Lecture 4 - Microgrid vs Conventional Power System
- Lecture 5 - AC and DC Microgrid with Distributed Energy Resources (AC Microgrid Part)
- Lecture 6 - AC and DC Microgrid with Distributed Energy Resources (AC Microgrid Part) (Continued...)
- Lecture 7 - Power Electronics for Microgrid
- Lecture 8 - Power Electronic Converters in Microgrid Applications
- Lecture 9 - Power Electronic Converters in Microgrid Applications (Power Electronic for Interfacing )
- Lecture 10 - Power Electronic Converters in Microgrid Applications (Converter Modulation Techniques)
- Lecture 11 - Modeling of converters in microgrid power system (AC/DC and DC/AC Converters Modeling)
- Lecture 12 - Modeling of Power Converters in Microgrid Power System (DC/DC Converter Modeling and Control)
- Lecture 13 - Modeling of Renewable Energy Resources (Modeling of Wind Energy System)
- Lecture 14 - Modeling of Renewable Energy Resources (Modeling of Photovoltaic System)
- Lecture 15 - Modeling of Energy Storage System
- Lecture 16 - Microgrid Dynamics and Modeling
- Lecture 17 - Microgrid Dynamics and Modeling (Continued...)
- Lecture 18 - Microgrid Operation Modes and Standards - Part I
- Lecture 19 - Microgrid Operation Modes and Standards - Part II
- Lecture 20 - Microgrid Control Architectures
- Lecture 21 - Microgrid Control Architectures (Continued...)
- Lecture 22 - Intelligent Microgrid Operation and Control
- Lecture 23 - Intelligent Microgrid Operation and Control (Continued...)
- Lecture 24 - Intelligent Microgrid Operation and Control (Continued...)
- Lecture 25 - Energy Management in Microgrid System (Continued...)
- Lecture 26 - DC Microgrid System Architecture and AC Interface
- Lecture 27 - DC Microgrid System Architecture and AC Interface (Continued...)
- Lecture 28 - DC Microgrid System Architecture and AC Interface (Continued...)
- Lecture 29 - DC Microgrid Dynamics and Modeling

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

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- Lecture 30 - DC Microgrid Dynamics and Modeling (Continued...)
- Lecture 31 - Control of DC Microgrid System
- Lecture 32 - Control of DC Microgrid System (Continued...)
- Lecture 33 - Applications of DC Microgrids
- Lecture 34 - Stability in Microgrid
- Lecture 35 - Stability Analysis of DC Microgrid
- Lecture 36 - Stability Analysis of DC Microgrid (Continued...)
- Lecture 37 - DC Microgrid stabilization strategies (Passive damping method)
- Lecture 38 - DC Microgrid Stabilization Strategies (Impedance/Admittance stability criteria)
- Lecture 39 - DC microgrid stabilization using nonlinear Techniques
- Lecture 40 - General Summary of DC Microgrids

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

NPTEL Video Course - Electrical Engineering - NOC:Power Quality Improvement Technique

Subject Co-ordinator - Prof. Avik Bhattacharya

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction  
Lecture 2 - Overview - I  
Lecture 3 - Overview - II  
Lecture 4 - Overview - III  
Lecture 5 - Source of Poor Power Quality - I  
Lecture 6 - Source of Poor Power Quality - II  
Lecture 7 - AC Power Quality Standard  
Lecture 8 - Improvement of Power Factor by Capacitor  
Lecture 9 - Passive Filter - I  
Lecture 10 - Passive Filter - II  
Lecture 11 - Passive Filter Design - I  
Lecture 12 - Passive Filter Design - II  
Lecture 13 - PWM Rectifier - I  
Lecture 14 - PWM Rectifier - II  
Lecture 15 - PWM Rectifier - III  
Lecture 16 - Three phase converters - I  
Lecture 17 - Three Phase Converters - II and multi pulse Converters  
Lecture 18 - Three Phase Converters - III and multi-pulse Converters  
Lecture 19 - VSI and CSI  
Lecture 20 - Multilevel Inverter - I  
Lecture 21 - Multilevel Inverter - II  
Lecture 22 - Multilevel Inverter - III  
Lecture 23 - PWM for Voltage Source Inverter - I  
Lecture 24 - PWM for Voltage Source Inverter - II  
Lecture 25 - PWM for Voltage Source inverter - III  
Lecture 26 - PWM for Voltage Source Inverter - IV  
Lecture 27 - Operation and Control of Grid-Connected VSC  
Lecture 28 - Grid Connected VSC with inner Current Control  
Lecture 29 - Shunt Active Power Filter - I

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

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- Lecture 30 - Shunt Active Power Filter - II
- Lecture 31 - Shunt Active Power Filter - III
- Lecture 32 - Shunt Active Power Filter - IV
- Lecture 33 - Hybrid Active Power Filter - I
- Lecture 34 - Hybrid Active power Filter - II
- Lecture 35 - Hybrid Shunt Active Power Filter
- Lecture 36 - UPQC Introduction and classification
- Lecture 37 - UPQC Classification
- Lecture 38 - Operation and Control of UPQC
- Lecture 39 - Control of UPQC
- Lecture 40 - Conclusion

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

NPTEL Video Course - Electrical Engineering - NOC:Power System Protection and Switchgear

Subject Co-ordinator - Prof. Bhaveshkumar R. Bhalja

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Fundamentals of Protective Relaying - I  
Lecture 2 - Fundamentals of Protective Relaying - II  
Lecture 3 - Fundamentals of Protective Relaying - III  
Lecture 4 - Fundamentals of Protective Relaying - IV  
Lecture 5 - Fundamentals of Protective Relaying - V  
Lecture 6 - Current based Relaying Scheme - I  
Lecture 7 - Current based Relaying Scheme - II  
Lecture 8 - Current based Relaying Scheme - III  
Lecture 9 - Current based Relaying Scheme - IV  
Lecture 10 - Current based Relaying Scheme - V  
Lecture 11 - Current based Relaying Scheme - VI  
Lecture 12 - Current based Relaying Scheme - VII  
Lecture 13 - Current based Relaying Scheme - VIII  
Lecture 14 - Protection of Transmission Lines using Distance Relays - I  
Lecture 15 - Protection of Transmission Lines using Distance Relays - II  
Lecture 16 - Protection of Transmission Lines using Distance Relays - III  
Lecture 17 - Protection of Transmission Lines using Distance Relays - IV  
Lecture 18 - Protection of Transmission Lines using Distance Relays - V  
Lecture 19 - Carrier Aided Schemes for Transmission Lines - I  
Lecture 20 - Carrier Aided Schemes for Transmission Lines - II  
Lecture 21 - Carrier Aided Schemes for Transmission Lines - III  
Lecture 22 - Carrier Aided Schemes for Transmission Lines - IV  
Lecture 23 - Auto-reclosing and Synchronizing - I  
Lecture 24 - Auto-reclosing and Synchronizing - II  
Lecture 25 - Auto-reclosing and Synchronizing - III  
Lecture 26 - Protection of Transformers - I  
Lecture 27 - Protection of Transformers - II  
Lecture 28 - Protection of Generators - I  
Lecture 29 - Protection of Generators - II

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

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- Lecture 30 - Protection of Induction Motors
- Lecture 31 - Protection of Busbars
- Lecture 32 - Protection against Transients and Surges along with System Response to Severe Upsets - I
- Lecture 33 - Protection against Transients and Surges along with System Response to Severe Upsets - II
- Lecture 34 - Arc Interruption Theory in Circuit Breaker - I
- Lecture 35 - Arc Interruption Theory in Circuit Breaker - II
- Lecture 36 - Arc Interruption Theory in Circuit Breaker - III
- Lecture 37 - Arc Interruption Theory in Circuit Breaker - IV
- Lecture 38 - Types of Circuit Breakers
- Lecture 39 - Testing, Commissioning and Maintenance of Relays - I
- Lecture 40 - Testing, Commissioning and Maintenance of Relays - II

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

NPTEL Video Course - Electrical Engineering - NOC:RF Transceiver of Design

Subject Co-ordinator - Prof. Darshak Bhatt

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Basic of Wireless Communication - I
- Lecture 2 - Basic of Wireless Communication - II
- Lecture 3 - Basic of Wireless Communication - III
- Lecture 4 - Basic of Wireless Communication - IV
- Lecture 5 - Basic of Wireless Communication - V
- Lecture 6 - Basic of Wireless Communication - VI
- Lecture 7 - Noise in RF Systems - I
- Lecture 8 - Noise in RF Systems - II
- Lecture 9 - Noise in RF Systems - III
- Lecture 10 - Noise in RF Systems - IV
- Lecture 11 - Non-Linearity in RF Systems - I
- Lecture 12 - Non-Linearity in RF Systems - II
- Lecture 13 - Non-Linearity in RF Systems - III
- Lecture 14 - Transceiver Architecture - I
- Lecture 15 - Transceiver Architecture - II
- Lecture 16 - Transceiver Architecture - III
- Lecture 17 - Transceiver Architecture - IV
- Lecture 18 - Transceiver Architecture - V
- Lecture 19 - Transceiver Architecture - VI
- Lecture 20 - Transceiver Architecture - VII
- Lecture 21 - Active Devices - I
- Lecture 22 - Active Devices - II
- Lecture 23 - Active Devices - III
- Lecture 24 - Active Devices - IV
- Lecture 25 - Passive Components and Impedance Matching - I
- Lecture 26 - Passive Components and Impedance Matching - II
- Lecture 27 - Passive Components and Impedance Matching - III
- Lecture 28 - Passive Components and Impedance Matching - IV
- Lecture 29 - Passive Components and Impedance Matching - V

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

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- Lecture 30 - Passive Components and Impedance Matching - VI
- Lecture 31 - Passive Components and Impedance Matching - VII
- Lecture 32 - Stability and Amplifier Design - I
- Lecture 33 - Stability and Amplifier Design - II
- Lecture 34 - Stability and Amplifier Design - III
- Lecture 35 - Stability and Amplifier Design - IV
- Lecture 36 - Low Noise Amplifier Design - I
- Lecture 37 - Low Noise Amplifier Design - II
- Lecture 38 - Low Noise Amplifier Design - III
- Lecture 39 - Low Noise Amplifier Design - IV
- Lecture 40 - Low Noise Amplifier Design - V
- Lecture 41 - Low Noise Amplifier Design - VI
- Lecture 42 - Mixer Design - I
- Lecture 43 - Mixer Design - II
- Lecture 44 - Mixer Design - III
- Lecture 45 - Mixer Design - IV
- Lecture 46 - Mixer Design - V
- Lecture 47 - Mixer Design - VI
- Lecture 48 - Mixer Design - VII
- Lecture 49 - Mixer Design - VIII
- Lecture 50 - Mixer Design - IX
- Lecture 51 - Oscillator Design - I
- Lecture 52 - Oscillator Design - II
- Lecture 53 - Oscillator Design - III
- Lecture 54 - Oscillator Design - IV
- Lecture 55 - Power Amplifier Design - I
- Lecture 56 - Power Amplifier Design - II
- Lecture 57 - Power Amplifier Design - III
- Lecture 58 - Basics of Phase Locked Loop - I
- Lecture 59 - Basics of Phase Locked Loop - II
- Lecture 60 - System Level Considerations
- Lecture 61 - RF Testing and Measurement Techniques

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

NPTEL Video Course - Electrical Engineering - NOC:VLSI Physical Design with Timing Analysis

Subject Co-ordinator - Prof. Bishnu Prasad Das

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction to VLSI Design
- Lecture 2 - Introduction to VLSI Physical Design
- Lecture 3 - Complexity Analysis for Algorithms
- Lecture 4 - Graphs for Physical Design
- Lecture 5 - Graph searching Algorithms
- Lecture 6 - Spanning Tree and Shortest Path Algorithms
- Lecture 7 - Overview of Timing Analysis
- Lecture 8 - Timing Arcs and Unateness
- Lecture 9 - Delay Parameters of a Combinational Circuit
- Lecture 10 - Delay Parameters of a Sequential Circuit
- Lecture 11 - Timing Analysis in a Sequential Circuit
- Lecture 12 - STA in Sequential Circuit with Clock Skew - I
- Lecture 13 - STA in Sequential Circuit with Clock Skew - II
- Lecture 14 - STA in Sequential Circuit with Clock Jitter
- Lecture 15 - STA considering OCV and CRPR (Setup check)
- Lecture 16 - STA considering OCV and CRPR (Hold check)
- Lecture 17 - STA for Combinational Circuits - I
- Lecture 18 - STA for Combinational Circuits - II
- Lecture 19 - Introduction to Partitioning - I
- Lecture 20 - Introduction to Partitioning - II
- Lecture 21 - Partitioning Algorithms
- Lecture 22 - Kernighan-Lin (KL) Algorithm
- Lecture 23 - Fiduccia-Mattheyses (FM) Algorithm
- Lecture 24 - Introduction to Floorplanning
- Lecture 25 - Floorplanning Representations
- Lecture 26 - Floorplanning Algorithms - 1
- Lecture 27 - Floorplanning Algorithms - 2
- Lecture 28 - Pin Assignment and Power - Ground Routing
- Lecture 29 - Introduction to Placement

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

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- Lecture 30 - Wirelength estimation techniques
- Lecture 31 - Min-cut placement
- Lecture 32 - Placement Algorithms
- Lecture 33 - Placement algorithms and legalization
- Lecture 34 - Introduction to Clock Tree Synthesis
- Lecture 35 - Clock Routing Algorithms - I
- Lecture 36 - Clock Routing Algorithms - II
- Lecture 37 - Clock Routing Algorithms - III
- Lecture 38 - Introduction and Optimization Goals - Global Routing
- Lecture 39 - Single net routing (Rectilinear routing)
- Lecture 40 - Global Routing in the connectivity graph
- Lecture 41 - Finding Shortest Paths with Dijkstra's Algorithm
- Lecture 42 - Full-Netlist Routing
- Lecture 43 - Introduction: Detailed Routing
- Lecture 44 - Channel Routing Algorithms - I
- Lecture 45 - Channel Routing Algorithms - II
- Lecture 46 - Switchbox and Over the cell routing
- Lecture 47 - Timing Constraints in latch based system
- Lecture 48 - Timing Constraints in Pulsed Latch-based System
- Lecture 49 - Time Borrowing in Latch
- Lecture 50 - Crosstalk Analysis
- Lecture 51 - Standard Cell Library
- Lecture 52 - Low Power Cells in Standard Cell Library
- Lecture 53 - Sub-threshold Standard Cell Library
- Lecture 54 - Timing Library for Standard Cells
- Lecture 55 - PDK and Other files
- Lecture 56 - Open-Source Tool Installation and Qflow
- Lecture 57 - Open-Source tool - YOSYS
- Lecture 58 - OpenSTA Static Timing Analyzer
- Lecture 59 - OpenROAD Physical Synthesis Flow - I
- Lecture 60 - OpenROAD Physical Synthesis Flow - II

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

NPTEL Video Course - Electrical Engineering - NOC:Modeling, Analysis and Estimation of Three Phase Unbalanced

Subject Co-ordinator - Prof. Biswarup Das

Co-ordinating Institute - IIT - Roorkee

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

- Lecture 1 - Introduction
- Lecture 2 - Carson's Line
- Lecture 3 - Carson's Line (Continued...)
- Lecture 4 - Three-phase Transmission Line - 1
- Lecture 5 - Three-phase Transmission Line - 2
- Lecture 6 - Three-phase Transmission Line (Continued...)
- Lecture 7 - Three-phase Transmission Line (Continued...)
- Lecture 8 - Three-phase Transmission Line (Continued...)
- Lecture 9 - Transposition of Transmission Line
- Lecture 10 - Transposition of Transmission Line (Continued...)
- Lecture 11 - Sequence impedance of Transmission Line
- Lecture 12 - Sequence impedance of Transmission Line (Continued...)
- Lecture 13 - Impedance of Transmission Line
- Lecture 14 - Impedance of Transmission Line (Continued...)
- Lecture 15 - Impedance of Transmission Line (Continued...)
- Lecture 16 - Impedance of Transmission Line (Continued...)
- Lecture 17 - Impedance of Transmission Line (Continued...)
- Lecture 18 - Impedance of Transmission Line (Continued...)
- Lecture 19 - Impedance of Transmission Line (Continued...)
- Lecture 20 - Impedance of Transmission Line (Continued...)
- Lecture 21 - Capacitance of Transmission Line
- Lecture 22 - Capacitance of Transmission Line (Continued...)
- Lecture 23 - Capacitance of Transmission Line (Continued...)
- Lecture 24 - Capacitance of Transmission Line (Continued...)
- Lecture 25 - Transformer Modeling (Introduction, YgYg0)
- Lecture 26 - Transformer Modeling (YgYg0, YgYg4)
- Lecture 27 - Transformer Modeling (YgD1)
- Lecture 28 - Transformer Modeling (YgD1, YD1)
- Lecture 29 - Transformer Modeling (YD1) (Continued...)

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

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- Lecture 30 - Transformer Modeling (YD1) (Continued...)
- Lecture 31 - Transformer Modeling (YYg0, Dd0)
- Lecture 32 - Transformer Modeling (Dd0, Overall Summary)
- Lecture 33 - Three-Phase Load Flow (Network Modelling)
- Lecture 34 - Three-Phase Load Flow (Formation of bus admittance matrix)
- Lecture 35 - Three-Phase Load Flow (Formation of bus admittance matrix) (Continued...)
- Lecture 36 - Three-Phase Load Flow (Formation of bus admittance matrix) (Continued...)
- Lecture 37 - Three-Phase Load Flow (General expression of bus admittance matrix)
- Lecture 38 - Three-Phase Load Flow (General expression of bus injected current)
- Lecture 39 - Three-Phase Load Flow (Derivation of power flow equations)
- Lecture 40 - Three-Phase Load Flow (Concept of Generator Internal Bus)
- Lecture 41 - Three-Phase Load Flow (Unknown Quantities)
- Lecture 42 - Three-Phase Load Flow (Classification of Unknown Quantities)
- Lecture 43 - Three-Phase Load Flow (Classification of Known Quantities)
- Lecture 44 - Three-Phase Load Flow (Equations Relating Known and Unknown Quantities)
- Lecture 45 - Three-Phase Load Flow (NRLF Polar Method)
- Lecture 46 - Three-Phase Load Flow (General Definitions and Dimensions of Jacobian Submatrices)
- Lecture 47 - Three-Phase Load Flow (Derivation of J1)
- Lecture 48 - Three-Phase Load Flow (Derivation of J1) (Continued...)
- Lecture 49 - Three-Phase Load Flow (Derivation of J2)
- Lecture 50 - Three-Phase Load Flow (Derivation of J3)
- Lecture 51 - Three-Phase Load Flow (Derivation of J3) (Continued...)
- Lecture 52 - Three-Phase Load Flow (Derivation of J4, J5, J6, J7, J8)
- Lecture 53 - Three-Phase Load Flow (Derivation of J9)
- Lecture 54 - Three-Phase Load Flow (Derivation of J9, J10)
- Lecture 55 - Three-Phase Load Flow (Derivation of J11, J12)
- Lecture 56 - Three-Phase Load Flow (Derivation of J13, J14, J15 and J16, Algorithm and Example)
- Lecture 57 - Three-Phase State Estimation (Revision of WLS State Estimation Method for Balanced Systems)
- Lecture 58 - Three-Phase State Estimation (Derivation of Measurement Functions for Unbalanced Systems)
- Lecture 59 - Three-Phase State Estimation (Derivation of Measurement Functions for Unbalanced Systems)
- Lecture 60 - Three-Phase State Estimation (General Structure of Jacobian Matrix, Example)

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

NPTEL Video Course - Electrical Engineering - An Introduction to Electronics Systems Packaging

Subject Co-ordinator - Prof. G.V. Mahesh

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction and Objectives of the course
- Lecture 2 - Definition of a system and history of semiconductors
- Lecture 3 - Products and levels of packaging
- Lecture 4 - Packaging aspects of handheld products; Case studies in applications
- Lecture 5 - Case Study (continued); Definition of PWB, summary and Questions for review
- Lecture 6 - Basics of Semiconductor and Process flowchart; Video on "Sand-to-Silicon"
- Lecture 7 - Wafer fabrication, inspection and testing
- Lecture 8 - Wafer packaging; Packaging evolution; Chip connection choices
- Lecture 9 - Wire bonding, TAB and flipchip-1
- Lecture 10 - Wire bonding, TAB and flipchip-2; Tutorials
- Lecture 11 - Why packaging? & Single chip packages or modules (SCM)
- Lecture 12 - Commonly used packages and advanced packages; Materials in packages
- Lecture 13 - Advances packages (continued); Thermal mismatch in packages; Current trends in packaging
- Lecture 14 - Multichip modules (MCM)-types; System-in-package (SIP); Packaging roadmaps; Hybrid circuits; Quid
- Lecture 15 - Electrical Issues I; Resistive Parasitic
- Lecture 16 - Electrical Issues II; Capacitive and Inductive Parasitic
- Lecture 17 - Electrical Issues III; Layout guidelines and the Reflection problem
- Lecture 18 - Electrical Issues IV; Interconnection
- Lecture 19 - Quick Tutorial on packages; Benefits from CAD; Introduction to DFM, DFR & DFT
- Lecture 20 - Components of a CAD package and its highlights
- Lecture 21 - Design Flow considerations; Beginning a circuit design with schematic work and component layout
- Lecture 22 - Demo and examples of layout and routing; Technology file generation from CAD; DFM check list and
- Lecture 23 - Review of CAD output files for PCB fabrication; Photo plotting and mask generation
- Lecture 24 - Process flow-chart; Vias; PWB substrates
- Lecture 25 - Substrates continued; Video highlights; Surface preparation
- Lecture 26 - Photoresist and application methods; UV exposure and developing; Printing technologies for PWBs
- Lecture 27 - PWB etching; Resist stripping; Screen-printing technology
- Lecture 28 - Through-hole manufacture process steps; Panel and pattern plating methods
- Lecture 29 - Video highlights on manufacturing; Solder mask for PWBs; Multilayer PWBs; Introduction to microv

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

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- Lecture 30 - Microvia technology and Sequential build-up technology process flow for high-density interconnect
- Lecture 31 - Conventional Vs HDI technologies; Flexible circuits; Tutorial session
- Lecture 32 - SMD benefits; Design issues; Introduction to soldering
- Lecture 33 - Reflow and Wave Soldering methods to attach SMDs
- Lecture 34 - Solders; Wetting of solders; Flux and its properties; Defects in wave soldering
- Lecture 35 - Vapour phase soldering, BGA soldering and Desoldering/Repair; SMT failures
- Lecture 36 - SMT failure library and Tin Whiskers
- Lecture 37 - Tin-lead and lead-free solders; Phase diagrams; Thermal profiles for reflow soldering; Lead-free
- Lecture 38 - Lead-free solder considerations; Green electronics; RoHS compliance and e-waste recycling issues
- Lecture 39 - Thermal Design considerations in systems packaging
- Lecture 40 - Introduction to embedded passives; Need for embedded passives; Design Library; Embedded resistor
- Lecture 41 - Embedded capacitors; Processes for embedding capacitors; Case study examples; Summary of materia
- Lecture 42 - Chapter-wise summary

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

NPTEL Video Course - Electrical Engineering - Power Electronics and Distributed Generation

Subject Co-ordinator - Dr. Vinod John

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Course introduction and overview
- Lecture 2 - Distributed generation technologies
- Lecture 3 - Distributed storage technologies
- Lecture 4 - Distribution system protection
- Lecture 5 - Circuit breaker coordination
- Lecture 6 - Symmetrical component analysis and sequence excitation
- Lecture 7 - Modeling of distribution system components
- Lecture 8 - Protection components
- Lecture 9 - Impact of distributed generation on distribution protection
- Lecture 10 - Consumption and distribution grounding
- Lecture 11 - Islanding of distribution systems
- Lecture 12 - Modeling of islanded distribution systems
- Lecture 13 - Distribution system problems and examples
- Lecture 14 - Distribution system problems and examples continued
- Lecture 15 - Anti-islanding methods
- Lecture 16 - Solid state circuit switching
- Lecture 17 - Relaying for distributed generation
- Lecture 18 - Feeder voltage regulation
- Lecture 19 - Grounding, distribution protection coordination problems and examples
- Lecture 20 - Ring and network distribution
- Lecture 21 - Economic evaluation of DG systems
- Lecture 22 - Design for effective initial cost
- Lecture 23 - Single phase inverters
- Lecture 24 - DC bus design in voltage source inverter
- Lecture 25 - Electrolytic capacitor reliability and lifetime
- Lecture 26 - Inverter switching and average model
- Lecture 27 - Common mode and differential mode model of inverters
- Lecture 28 - Two leg single phase inverter
- Lecture 29 - Distribution system problems, and examples

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

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- Lecture 30 - DG evaluation problems and examples
- Lecture 31 - Switch selection in two level voltage source inverters and loss evaluation
- Lecture 32 - Thermal model, management and cycling failure of IGBT modules
- Lecture 33 - Semiconductor switch design reliability considerations
- Lecture 34 - AC filters for grid connected inverters
- Lecture 35 - AC inductor design and need for LCL filter
- Lecture 36 - LCL filter design
- Lecture 37 - Examples in power electronic design for DG systems
- Lecture 38 - Examples in power electronic design for DG systems continued
- Lecture 39 - Higher order passive damping design for LCL filters
- Lecture 40 - Balance of hardware component for inverters in DG systems

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

NPTEL Video Course - Electrical Engineering - Pulse width Modulation for Power Electronic Converters

Subject Co-ordinator - Dr. G. Narayanan

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Electronic switches
- Lecture 2 - DC - DC converters
- Lecture 3 - DC - AC converters
- Lecture 4 - Multilevel converters - I
- Lecture 5 - Multilevel converters - II
- Lecture 6 - Applications of voltage source converter - I
- Lecture 7 - Applications of voltage source converter - II
- Lecture 8 - Applications of voltage source converter - III
- Lecture 9 - Purpose of PWM - I
- Lecture 10 - Purpose of PWM - II
- Lecture 11 - Low switching frequency PWM - I
- Lecture 12 - Low switching frequency PWM - II
- Lecture 13 - Selective harmonic elimination
- Lecture 14 - Off-line optimized pulsewidth modulation
- Lecture 15 - Sine-triangle pulsewidth modulation
- Lecture 16 - Harmonic injection pulsewidth modulation
- Lecture 17 - Bus-clamping pulsewidth modulation
- Lecture 18 - Triangle-comparison based PWM for three-phase inverter
- Lecture 19 - Concept of space vector
- Lecture 20 - Conventional space vector PWM
- Lecture 21 - Space vector based bus-clamping PWM
- Lecture 22 - Space vector based advanced bus-clamping PWM
- Lecture 23 - Harmonic analysis of PWM techniques
- Lecture 24 - Analysis of RMS line current ripple using the notion of stator flux ripple
- Lecture 25 - Evaluation of RMS line current ripple using the notion of stator flux ripple
- Lecture 26 - Analysis and design of PWM techniques from line current ripple perspective
- Lecture 27 - Instantaneous and average dc link current in a voltage source inverter
- Lecture 28 - DC link current and DC capacitor current in a voltage source inverter
- Lecture 29 - Analysis of torque ripple in induction motor drives - I

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

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- Lecture 30 - Analysis of torque ripple in induction motor drives - II
- Lecture 31 - Evaluation of conduction loss in three-phase inverter
- Lecture 32 - Evaluation of switching loss in three-phase inverter
- Lecture 33 - Design of PWM for reduced switching loss in three-phase inverter
- Lecture 34 - Effect of dead-time on inverter output voltage for continuous PWM schemes
- Lecture 35 - Effect of dead-time on inverter output voltage for bus-clamping PWM schemes
- Lecture 36 - Analysis of overmodulation in sine-triangle PWM from space vector perspective
- Lecture 37 - Overmodulation in space vector modulated inverter
- Lecture 38 - PWM for three-level neutral-point-clamped inverter - I
- Lecture 39 - PWM for three-level neutral-point-clamped inverter - II
- Lecture 40 - PWM for three-level neutral-point-clamped inverter - III

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

NPTEL Video Course - Electrical Engineering - Switched Mode Power Conversion

Subject Co-ordinator - Prof. L. Umanand, Prof. V. Ramanarayanan

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction to DC-DC converter  
Lecture 2 - Diode  
Lecture 3 - Controlled Switches  
Lecture 4 - Prior Art  
Lecture 5 - Inductor  
Lecture 6 - Transformer  
Lecture 7 - Capacitor  
Lecture 8 - Issues related to switches  
Lecture 9 - Energy storage - Capacitor  
Lecture 10 - Energy storage - Inductor  
Lecture 11 - Primitive Converter  
Lecture 12 - Non-Isolated converter - I  
Lecture 13 - Non-Isolated converter - II  
Lecture 14 - Isolated Converters - I  
Lecture 15 - Isolated Converters - II  
Lecture 16 - Conduction Mode  
Lecture 17 - Problem set - I  
Lecture 18 - Problem set - II  
Lecture 19 - Modeling DC-DC converters  
Lecture 20 - State space representation - I  
Lecture 21 - State Space representation - II  
Lecture 22 - Circuit Averaging - I  
Lecture 23 - Circuit Averaging - II  
Lecture 24 - State Space Model of Boost Converter  
Lecture 25 - DC-DC converter controller  
Lecture 26 - Controller Structure  
Lecture 27 - PID Controller - I  
Lecture 28 - PID Controller - II  
Lecture 29 - PID Controller - III

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

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- Lecture 30 - Implementation of PID controller
- Lecture 31 - Pulse Width Modulator
- Lecture 32 - Controller Design - I
- Lecture 33 - Controller Design - II
- Lecture 34 - Controllers and Sensing Circuit
- Lecture 35 - Regulation of Multiple outputs - I
- Lecture 36 - Regulation of Multiple outputs - II
- Lecture 37 - Current Control
- Lecture 38 - Unity Power Factor Converter
- Lecture 39 - Magnetic Design
- Lecture 40 - DC-DC Converter Design

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

NPTEL Video Course - Electrical Engineering - Basic Electrical Technology

Subject Co-ordinator - Prof. L. Umanand

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Basic Electrical Technology  
Lecture 2 - Passive Components  
Lecture 3 - Sources  
Lecture 4 - Kirchoff's Law  
Lecture 5 - Modelling of Circuit - Part 1  
Lecture 6 - Modelling of Circuit - Part 2  
Lecture 7 - Analysis Using MatLab  
Lecture 8 - Sinusoidal steady state  
Lecture 9 - Transfer Function and Pole Zero domain  
Lecture 10 - Transfer function & pole zero  
Lecture 11 - The Sinusoid  
Lecture 12 - Phasor Analysis - Part 1  
Lecture 13 - Phasor Analysis - Part 2  
Lecture 14 - Power Factor  
Lecture 15 - Power ports  
Lecture 16 - Transformer Basics - Part 1  
Lecture 17 - Transformer Basics - Part 2  
Lecture 18 - Transformer Basics - Part 3  
Lecture 19 - The Practical Transformer - Part 1  
Lecture 20 - The Practical Transformer - Part 2  
Lecture 21 - The Practical Transformer - Part 3  
Lecture 22 - DC Machines - Part 1  
Lecture 23 - DC Machines - Part 2  
Lecture 24 - DC Generators - Part 1  
Lecture 25 - DC Generators - Part 2  
Lecture 26 - DC Motors - Part 1  
Lecture 27 - DC Motors - Part 2  
Lecture 28 - DC Motors - Part 3  
Lecture 29 - Three Phase System - Part 1

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

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- Lecture 30 - Three Phase System - Part 2
- Lecture 31 - Three Phase System - Part 3
- Lecture 32 - Three Phase System - Part 4
- Lecture 33 - Three Phase Transformer - Part 1
- Lecture 34 - Three Phase Transformer - Part 2
- Lecture 35 - Induction Motor - Part 1
- Lecture 36 - Induction Motor - Part 2
- Lecture 37 - Induction Motor - Part 3
- Lecture 38 - Induction Motor - Part 4
- Lecture 39 - Synchronous Machine

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

NPTEL Video Course - Electrical Engineering - Industrial Drives - Power Electronics

Subject Co-ordinator - Prof. K. Gopakumar

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Electric Drive
- Lecture 2 - Controlled Rectifier - Part-1
- Lecture 3 - Controlled Rectifier - Part-2 (Three phase)
- Lecture 4 - Controlled Rectifier - Part-3 (Three phase)
- Lecture 5 - Controlled Rectifier - Part-4 (Three Phase)
- Lecture 6 - Controlled Rectifier - Part-5 (Three Phase)
- Lecture 7 - Power Electronics Improvements
- Lecture 8 - Four Quadrant Dc to Dc Converter
- Lecture 9 - Sine Triangle PWM Control of Converter
- Lecture 10 - Front-end Ac-Dc Converter with harmonic control
- Lecture 11 - Ac to Dc Converter Close Loop Control Schematic
- Lecture 12 - Ac-Dc Converter Close loop Control Block Diagram
- Lecture 13 - Design of the Converter Controller & AC to DC
- Lecture 14 - Front-End Ac to Dc Converter-Design
- Lecture 15 - Front-End Ac to Dc Converter - Simulation study
- Lecture 16 - Dc Motor Speed Control - Introduction
- Lecture 17 - Dc Motor Speed Control - Block Diagram
- Lecture 18 - Dc Motor Speed Control Current Control & S C L
- Lecture 19 - Dc-Motor Speed Control Controller Design - Part-1
- Lecture 20 - Dc Motor Speed Control Controller Design - Part-2
- Lecture 21 - Dc Motor Speed Control Controller Design - Part-3
- Lecture 22 - Basics of DC to AC Converter - Part-1
- Lecture 23 - Basics of DC to AC Converter - Part-2
- Lecture 24 - Inverter Sine Triangle PWM
- Lecture 25 - Inverter - Current Hysteresis Controlled PWM
- Lecture 26 - C H controlled & Basics of space vector PWM
- Lecture 27 - Space Vector PWM - Part-2
- Lecture 28 - Space Vector PWM - Part-3
- Lecture 29 - Space Vector PWM Signal Generation

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

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- Lecture 30 - Speed Control of Induction Motor - Part-1
- Lecture 31 - Speed Control of Induction Motor - Part-2
- Lecture 32 - High dynamic performance of I M Drive
- Lecture 33 - Dynamic Model of Induction Motor - Part-1
- Lecture 34 - Dynamic Model of Induction Motor - Part-2
- Lecture 35 - Vector Control of Induction Motor
- Lecture 36 - Effect of Switching Time lag in Inverter
- Lecture 37 - Power Switch Protection - Snubbers

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

NPTEL Video Course - Electrical Engineering - NOC:Design for Internet of Things

Subject Co-ordinator - Prof. T.V. Prabhakar

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to IOTs - Part I
- Lecture 2 - Introduction to IOTs - Part II
- Lecture 3 - Introduction to IOTs - Examples
- Lecture 4 - IOT applications - I
- Lecture 5 - IOT applications - II
- Lecture 6 - Power management in IOT device
- Lecture 7 - Introduction to LDO
- Lecture 8 - Design with an LDO
- Lecture 9 - Introduction to switching regulators
- Lecture 10 - Designing with LDO's, switching regulators and case studies - Part I
- Lecture 11 - Designing with LDO's, switching regulators and case studies - Part II
- Lecture 12 - Designing with LDO's, switching regulators and case studies - Part II
- Lecture 13 - Designing with LDO's, switching regulators and case studies - Part IV
- Lecture 14 - Power Conditioning with Energy Harvesters - I
- Lecture 15 - Power Conditioning with Energy Harvesters - II
- Lecture 16 - Power Conditioning with Energy Harvesters - III
- Lecture 17 - Battery less power supply and battery life calculation for embedded devices - I
- Lecture 18 - Battery less power supply and battery life calculation for embedded devices - II
- Lecture 19 - Battery less power supply and battery life calculation for embedded devices - III
- Lecture 20 - Introduction to MQTT
- Lecture 21 - Quality of Service in MQTT
- Lecture 22 - Standards and Security in MQTT
- Lecture 23 - Introduction and Implementation of AMQP
- Lecture 24 - Implementation of CoAP and MDNS
- Lecture 25 - Basics of RFID
- Lecture 26 - RFID protocol and applications
- Lecture 27 - BLE Security
- Lecture 28 - LPWAN technologies
- Lecture 29 - Choice of Microcontrollers

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

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Lecture 30 - Case Study 1 - Joule Jotter  
Lecture 31 - Case Study 2 - Cloud Based Systems

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

NPTEL Video Course - Electrical Engineering - NOC:Advances in UHV Transmission and Distribution

Subject Co-ordinator - Prof Subba Reddy B

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Advantages of HVAC/DC Transmission, Introduction to Grid Management
- Lecture 2 - Transmission system development, Important components of transmission system
- Lecture 3 - Insulation coordination, over voltage in power systems
- Lecture 4 - Design/selection of insulators, Importance of grading/cc rings
- Lecture 5 - Non ceramic insulators performance-service experience
- Lecture 6 - Failure of apparatus in the field, importance of reliability and testing
- Lecture 7 - Pollution flashover phenomena, modeling etc
- Lecture 8 - Planning of High Voltage laboratories
- Lecture 9 - Importance of High Voltage testing and techniques employed
- Lecture 10 - Basic philosophy of HV testing, tests for various HV apparatus
- Lecture 11 - HV testing techniques for various apparatus
- Lecture 12 - HV testing on Composite Insulators
- Lecture 13 - Surface degradation studies on composite insulators
- Lecture 14 - Surface morphological techniques for composite insulators
- Lecture 15 - Conductors used for EHV/UHV transmission
- Lecture 16 - Corona and interference on transmission lines
- Lecture 17 - Introduction of HTLS conductors and their advantages
- Lecture 18 - Mechanical considerations for HV conductors
- Lecture 19 - Introduction to Towers and importance of foundations
- Lecture 20 - Selection/Design of clearances for HV towers
- Lecture 21 - Design Optimization for UHV towers
- Lecture 22 - Introduction to 1100kV HVDC
- Lecture 23 - Introduction to HV Substations
- Lecture 24 - Types of Substations, comparison
- Lecture 25 - Insulation coordination, Components in a typical substation
- Lecture 26 - Preventive maintenance of Substation
- Lecture 27 - Electric and magnetic fields, mitigations techniques
- Lecture 28 - Importance of Grounding, reducing Earthing resistance
- Lecture 29 - Introduction to the use of Fiber optic cables, OPGW

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

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- Lecture 30 - Introduction to communication and SCADA
- Lecture 31 - Precautions and safety measures in substation
- Lecture 32 - Electrical hazards, minimum clearances in substation
- Lecture 33 - Importance of Generation of HVDC in the laboratory
- Lecture 34 - Importance of Generation of HVAC, Impulse Voltage and Currents in the laboratory
- Lecture 35 - Measurements of High Voltages
- Lecture 36 - Measurements of High Voltages (Continued...)
- Lecture 37 - Introduction to digital recorders, measurement
- Lecture 38 - Upgradation/uprating of transmission lines- advantages
- Lecture 39 - Upgradation/uprating of transmission lines- advantages (Continued...)
- Lecture 40 - Summary of the course

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

NPTEL Video Course - Electrical Engineering - NOC:Mathematical Methods and Techniques in Signal Processing

Subject Co-ordinator - Prof. Shayan Srinivasa Garani

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to signal processing
- Lecture 2 - Basics of signals and systems
- Lecture 3 - Linear time-invariant systems
- Lecture 4 - Modes in a linear system
- Lecture 5 - Introduction to state space representation
- Lecture 6 - State space representation
- Lecture 7 - Non-uniqueness of state space representation
- Lecture 8 - Introduction to vector space
- Lecture 9 - Linear independence and spanning set
- Lecture 10 - Unique representation theorem
- Lecture 11 - Basis and cardinality of basis
- Lecture 12 - Norms and inner product spaces
- Lecture 13 - Inner products and induced norm
- Lecture 14 - Cauchy Schwartz inequality
- Lecture 15 - Orthonormality
- Lecture 16 - Problem on sum of subspaces
- Lecture 17 - Linear independence of orthogonal vectors
- Lecture 18 - Hilbert space and linear transformation
- Lecture 19 - Gram Schmidt orthonormalization
- Lecture 20 - Linear approximation of signal space
- Lecture 21 - Gram Schmidt orthogonalization of signals
- Lecture 22 - Problem on orthogonal complement
- Lecture 23 - Problem on signal geometry (4-QAM)
- Lecture 24 - Basics of probability and random variables
- Lecture 25 - Mean and variance of a random variable
- Lecture 26 - Introduction to random process
- Lecture 27 - Statistical specification of random processes
- Lecture 28 - Stationarity of random processes
- Lecture 29 - Problem on mean and variance

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

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- Lecture 30 - Problem on MAP Detection
- Lecture 31 - Fourier transform of dirac comb sequence
- Lecture 32 - Sampling theorem
- Lecture 33 - Basics of multirate systems
- Lecture 34 - Frequency representation of expanders and decimators
- Lecture 35 - Decimation and interpolation filters
- Lecture 36 - Fractional sampling rate alterations
- Lecture 37 - Digital filter banks
- Lecture 38 - DFT as filter bank
- Lecture 39 - Noble Identities
- Lecture 40 - Polyphase representation
- Lecture 41 - Efficient architectures for interpolation and decimation filters
- Lecture 42 - Problems on simplifying multirate systems using noble identities
- Lecture 43 - Problem on designing synthesis bank filters
- Lecture 44 - Efficient architecture for fractional decimator
- Lecture 45 - Multistage filter design
- Lecture 46 - Two-channel filter banks
- Lecture 47 - Amplitude and phase distortion in signals
- Lecture 48 - Polyphase representation of 2-channel filter banks, signal flow graphs and perfect reconstruction
- Lecture 49 - M-channel filter banks
- Lecture 50 - Polyphase representation of M-channel filter bank
- Lecture 51 - Perfect reconstruction of signals
- Lecture 52 - Nyquist and half band filters
- Lecture 53 - Special filter banks for perfect reconstruction
- Lecture 54 - Introduction to wavelets
- Lecture 55 - Multiresolution analysis and properties
- Lecture 56 - The Haar wavelet
- Lecture 57 - Structure of subspaces in MRA
- Lecture 58 - Haar decomposition - 1
- Lecture 59 - Haar decomposition - 2
- Lecture 60 - Wavelet Reconstruction
- Lecture 61 - Haar wavelet and link to filter banks
- Lecture 62 - Demo on wavelet decomposition
- Lecture 63 - Problem on circular convolution
- Lecture 64 - Time frequency localization
- Lecture 65 - Basic analysis
- Lecture 66 - Basic Analysis
- Lecture 67 - Fourier series and notions of convergence
- Lecture 68 - Convergence of Fourier series at a point of continuity

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

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- Lecture 69 - Convergence of Fourier series for piecewise differentiable periodic functions
- Lecture 70 - Uniform convergence of Fourier series of piecewise smooth periodic function
- Lecture 71 - Convergence in norm of Fourier series
- Lecture 72 - Convergence of Fourier series for all square integrable periodic functions
- Lecture 73 - Problem on limits of integration of periodic functions
- Lecture 74 - Matrix Calculus
- Lecture 75 - KL transform
- Lecture 76 - Applications of KL transform
- Lecture 77 - Demo on KL Transform
- Lecture 78 - Live Session
- Lecture 79 - Live Session 2

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

NPTEL Video Course - Electrical Engineering - NOC:Electronics Enclosures Thermal Issues

Subject Co-ordinator - Prof. N. V Chalapathi Rao

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Electronic Equipment Thermal issues

Lecture 2 - Practical Examples - 1

Lecture 3 - Practical Examples - 2

Lecture 4 - CEDT worked examples - 1

Lecture 5 - CEDT worked examples - 2

Lecture 6 - Text book theory

Lecture 7 - Sample heat sinks

Lecture 8 - Published correlations - 1

Lecture 9 - Published correlations - 2

Lecture 10 - Parallel combined effects

Lecture 11 - Mounting of packages

Lecture 12 - Combined Rth of devices

Lecture 13 - Schonholzer moduls

Lecture 14 - 1972 model paper

Lecture 15 - Jensen model

Lecture 16 - Thermal management - 1

Lecture 17 - Thermal management - 2

Lecture 18 - Round up of full model

Lecture 19 - Fan cooling

Lecture 20 - Thermo-electric cooling

Lecture 21 - On-the-net DIY work

Lecture 22 - Practical video

Lecture 23 - Lecture 23

Lecture 24 - Lecture 24

Lecture 25 - Lecture 25

Lecture 26 - Lecture 26

Lecture 27 - Real packages

Lecture 28 - Prior art

Lecture 29 - OTS standard profiles

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

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- Lecture 30 - CAD detailed design of profiles
- Lecture 31 - Round up
- Lecture 32 - 4X Peltier Cooler
- Lecture 33 - Manufacturing Video
- Lecture 34 - Peltier heat sink

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

NPTEL Video Course - Electrical Engineering - NOC: Integrated Circuits, MOSFETs, Op-Amps and their Application

Subject Co-ordinator - Prof. Hardik Jeetendra Pandya

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to Integrated Circuits (IC) Technology
- Lecture 2 - Introduction to fabrication of IC
- Lecture 3 - Introduction to IC fabrication
- Lecture 4 - Introduction to IC fabrication (Continued...)
- Lecture 5 - Introduction to the fabrication of sensors
- Lecture 6 - Introduction to fabrication technology
- Lecture 7 - Introduction to fabrication technology (Continued...)
- Lecture 8 - Introduction to fabrication technology (Continued...)
- Lecture 9 - Introduction to fabrication technology (Continued...)
- Lecture 10 - Introduction to fabrication technology (Continued...)
- Lecture 11 - Process flow for Fabrication of MOSFETs
- Lecture 12 - Operation of Enhancement type MOSFET
- Lecture 13 - Operation of Depletion type MOSFET
- Lecture 14 - MOSFETs Characteristics and Applications (Current Mirrors)
- Lecture 15 - Introduction to Operational Amplifiers
- Lecture 16 - Operational Amplifier Characteristics
- Lecture 17 - Operational Amplifier Characteristics (Continued...)
- Lecture 18 - Characteristics of an op-amp (Continued...)
- Lecture 19 - Operational Amplifier Configurations
- Lecture 20 - Operational Amplifier Configurations (Continued...)
- Lecture 21 - Applications of Operational Amplifier
- Lecture 22 - Applications of Operational Amplifier
- Lecture 23 - Applications of Operational Amplifier
- Lecture 24 - Introduction to Passive and Active Filters and op-amp as Low Pass Filter
- Lecture 25 - Operational Amplifier as a High Pass Filter
- Lecture 26 - Operational Amplifier as a Band Pass and Band Reject Filter
- Lecture 27 - Introduction to Oscillator
- Lecture 28 - RC Phase Shift Oscillator using Op-amp
- Lecture 29 - Wein Bridge Oscillator using Op-amp

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

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- Lecture 30 - Hartley and Colpitts Oscillator using Op-amp
- Lecture 31 - Working of Crystal Oscillators
- Lecture 32 - Construction and Operation of UJT Relaxation Oscillators
- Lecture 33 - Introduction to Noise and its Types
- Lecture 34 - Analysis of Data Sheets of an Op-Amp
- Lecture 35 - Analysis of Data Sheets of an Op-Amp (Continued...)
- Lecture 36 - Analysis of Data Sheets of an Op-Amp (Continued...)
- Lecture 37 - Experiment - Introduction to Laboratory Equipment
- Lecture 38 - Experiment - Measurement of Active and Passive elements using Multimeter
- Lecture 39 - Experiment - Working with Laboratory Equipment
- Lecture 40 - Experiment - Working with Laboratory Equipment
- Lecture 41 - Experiment - Op-Amp Characteristics
- Lecture 42 - Experiment - Op-Amp Characteristics
- Lecture 43 - Experiment - Op-Amp Characteristics
- Lecture 44 - Experiment - Op-Amp as Inverting Amplifier
- Lecture 45 - Experiment - Op-Amp as Non-Inverting Amplifier
- Lecture 46 - Experiment - To study input and output voltage range of an Op-Amp
- Lecture 47 - Experiment - Differential amplifier using op-amp
- Lecture 48 - Experiment - To study the gain of instrumentation amplifier
- Lecture 49 - Experiment - Summing amplifier using op-amp
- Lecture 50 - Experiment - To study op-amp based comparator
- Lecture 51 - Experiment - To study op-amp based integrator and differentiator
- Lecture 52 - Experiment - Study of passive low pass filter
- Lecture 53 - Experiment - Op-amp based active low pass filter
- Lecture 54 - Experiment - Passive and active high pass filter
- Lecture 55 - Experiment - Introduction to experimental set-up of band pass filter
- Lecture 56 - Experiment - Passive and active band pass filter
- Lecture 57 - Experiment - Introduction to experimental set-up for band reject filter
- Lecture 58 - Experiment - Active band reject filter
- Lecture 59 - Experiment - Peak detector circuit using Op-Amp

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

NPTEL Video Course - Electrical Engineering - NOC:Semiconductor Devices and Circuits

Subject Co-ordinator - Prof. Sanjiv Sambandan

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Quantum Mechanics
- Lecture 2 - Quantum Mechanics
- Lecture 3 - Quantum Mechanics
- Lecture 4 - Solids
- Lecture 5 - Solids
- Lecture 6 - Solids
- Lecture 7 - Solids
- Lecture 8 - Solids
- Lecture 9 - Density of States
- Lecture 10 - Density of States (Continued...), Fermi Function
- Lecture 11 - Fermi Function - Carrier Concentration
- Lecture 12 - Doping
- Lecture 13 - Doping (Continued...)
- Lecture 14 - Recombination and Generation
- Lecture 15 - Recombination and Generation (Continued...)
- Lecture 16 - Recombination and Generation (Continued...), Charge Transport
- Lecture 17 - Charge Transport (Continued...)
- Lecture 18 - Continuity Equation
- Lecture 19 - Junctions
- Lecture 20 - Metal Semiconductor Junctions
- Lecture 21 - Schottky Contact
- Lecture 22 - Schottky Contact
- Lecture 23 - Schottky Contact
- Lecture 24 - Schottky Contact
- Lecture 25 - PN Junctions
- Lecture 26 - PN Junctions
- Lecture 27 - PN Junctions
- Lecture 28 - PN Junctions
- Lecture 29 - Bipolar Junction Transistors (BJT)

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

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- Lecture 30 - BJT
- Lecture 31 - BJT
- Lecture 32 - Metal Oxide Semiconductor Capacitor (MOSCAP)
- Lecture 33 - MOSCAP (Continued...)
- Lecture 34 - MOSCAP
- Lecture 35 - MOSCAP
- Lecture 36 - MOSFET
- Lecture 37 - MOSFET
- Lecture 38 - MOSFET
- Lecture 39 - MOSFET
- Lecture 40 - Subthreshold swing, Additional concepts
- Lecture 41 - Trapped charge, Body-bias
- Lecture 42 - Scaling of MOSFETs
- Lecture 43 - Scaling of MOSFETs (Continued...), Leakage currents in MOSFETs
- Lecture 44 - MOSFET characterization
- Lecture 45 - MOSFET characterization
- Lecture 46 - MOSFET as a switch
- Lecture 47 - MOSFET as a switch (Continued...)
- Lecture 48 - Amplifiers using MOSFET
- Lecture 49 - Amplifiers using MOSFET (Continued...)
- Lecture 50 - Circuits
- Lecture 51 - Introduction
- Lecture 52 - Thin Film Transistors
- Lecture 53 - Tutorials Session - 1
- Lecture 54 - Tutorials Session - 2
- Lecture 55 - Tutorials Session - 3



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

NPTEL Video Course - Electrical Engineering - NOC:Fabrication Techniques for MEMs-based Sensors: Clinical Per

Subject Co-ordinator - Prof. Hardik Jeetendra Pandya

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to Microengineering Devices
- Lecture 2 - Introduction to Microengineering Devices (Continued...)
- Lecture 3 - Introduction to Microengineering Devices (Continued...)
- Lecture 4 - Silicon, silicon di-oxide and photolithography
- Lecture 5 - Silicon, silicon di-oxide and photolithography (Continued...)
- Lecture 6 - Physical Vapour Deposition
- Lecture 7 - Physical Vapour Deposition (Continued...)
- Lecture 8 - Photolithography
- Lecture 9 - Mask Aligner
- Lecture 10 - Mask Aligner (Continued...)
- Lecture 11 - Micromachining
- Lecture 12 - Micromachining
- Lecture 13 - Micromachining
- Lecture 14 - Micromachining
- Lecture 15 - Chemical Vapour Deposition
- Lecture 16 - Typical Microfabricated Devices for Biomedical Applications
- Lecture 17 - Cancer Diagnostic Tool
- Lecture 18 - Process flow for Fabrication of Micro Heater
- Lecture 19 - Process flow for Fabrication of Interdigitated Electrodes
- Lecture 20 - Process flow for Fabrication of Interdigitated Electrodes (Continued...)
- Lecture 21 - Process flow for Fabrication of ETM phenotyping
- Lecture 22 - Process flow for Fabrication of Piezo canteliver
- Lecture 23
- Lecture 24
- Lecture 25
- Lecture 26
- Lecture 27 - Microchip for Rapid Drug Screening
- Lecture 28 - Microchip for Rapid Drug Screening (Continued...)
- Lecture 29 - A Microfluidic chip for rapid bacterial antibiotic Susceptibility testing

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

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- Lecture 30 - Smart Catheter
- Lecture 31 - Smart Catheter
- Lecture 32 - Smart Catheter
- Lecture 33 - Tissue and Cell Culture Techniques
- Lecture 34 - Clean Room
- Lecture 35 - GLP
- Lecture 36 - Introduction to Equipments
- Lecture 37 - Gowning Procedure for using Biological Lab Setup
- Lecture 38 - Introduction to Equipments
- Lecture 39 - Introduction to Equipments
- Lecture 40 - Introduction to Equipments
- Lecture 41 - Function generator, Multimeter, Sampling, LabVIEW, NI-CDAQ
- Lecture 42 - Introduction to Equipments
- Lecture 43 - Introduction to Equipments
- Lecture 44 - Introduction to Equipments
- Lecture 45 - Introduction to Equipments
- Lecture 46 - Introduction to Equipments
- Lecture 47 - Introduction to Equipments
- Lecture 48 - Introduction to Equipments
- Lecture 49 - Introduction to Equipments
- Lecture 50 - Introduction to Equipments
- Lecture 51 - PDMS Moulding
- Lecture 52 - 3D Printing
- Lecture 53 - Introduction to Fabricated Sensors
- Lecture 54 - Simulation
- Lecture 55 - Simulation

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

NPTEL Video Course - Electrical Engineering - NOC:Op-Amp Practical Applications: Design, Simulation and Implementation

Subject Co-ordinator - Prof. Hardik Jeetendra Pandya

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction/Summary on Op-amps
- Lecture 2 - Introduction/Summary on Op-amps (Continued...)
- Lecture 3 - Introduction/Summary on Op-amps (Continued...)
- Lecture 4 - Effect of Loading and Input Impedance - Part 1
- Lecture 5 - Effect of Loading and Input Impedance - Part 2
- Lecture 6 - Effect of Loading and Input Impedance - Part 3
- Lecture 7 - Effect of Loading and Input Impedance - Part 4
- Lecture 8 - Introduction to an Analog Circuit Development Board (TI ASLK Pro)
- Lecture 9 - Op-amp Applications
- Lecture 10 - Op-amp Applications
- Lecture 11 - Op-amp Applications
- Lecture 12 - Op-amp Circuits using Diodes
- Lecture 13 - Understanding the Range of Feedback Amplifiers
- Lecture 14 - Op-amps as Phase Shift Oscillator
- Lecture 15 - Op-amp as Wein Bridge Oscillator
- Lecture 16 - Op-amp as Hartley Oscillator
- Lecture 17 - Op-amp as Colpitts Oscillator
- Lecture 18 - Op-amps as Comparator
- Lecture 19 - Op-amp with Positive Feedback
- Lecture 20 - Op-amp with Positive Feedback
- Lecture 21 - Op-amp with Positive Feedback
- Lecture 22 - Op-amp with Positive Feedback
- Lecture 23 - Op-amp based Voltage Controlled Current Source
- Lecture 24 - Measure of Unknown Resistance by Constant Current Drive Circuit Implemented using Op-amp
- Lecture 25 - Design and Development of Temperature Controlled Circuit using Op-amp as ON-OFF, Proportional and Integral Controller
- Lecture 26 - Implementation of Error Detector Circuit and Signal Conditioning Circuit for Temperature Control
- Lecture 27 - Implementation of Plant/Heating Circuit and ON-OFF Controller
- Lecture 28 - Implementation of P and PI Controllers
- Lecture 29 - Experiment on Controlling the Temperature on the Plant using different Controllers

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

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- Lecture 30 - Experiment
- Lecture 31 - Introduction to ECG Experiment
- Lecture 32 - Design and Implementation of ECG Preprocessing Stage - Part 1
- Lecture 33 - Design and Implementation of ECG Preprocessing Stage - Part 2
- Lecture 34 - Design and Implementation of ECG Preprocessing Stage - Part 3
- Lecture 35 - Design and Implementation of ECG Preprocessing Stage - Part 4
- Lecture 36 - Design and Implementation of Peak Detector and Thresholding Circuit for ECG Signal Conditioning
- Lecture 37 - Live Demonstration on ECG Signal Acquisition, Conditioning and Measurement of BPM
- Lecture 38 - Understanding Analog Multipliers using Development Board
- Lecture 39 - Application
- Lecture 40 - Introduction to Data-Acquisition
- Lecture 41 - Analog to Digital Conversion Circuits and Experiment on 2-bit Flash Type ADC
- Lecture 42 - Digital to Analog Conversion Circuits and Experiment on 4-bit R-2R DAC
- Lecture 43 - DAC Basics using Development Board - Introduction
- Lecture 44 - Understanding DAC 7821 Datasheet
- Lecture 45 - Basic DAC Experiment on Variable Gain Amplifier
- Lecture 46 - Understanding DAC
- Lecture 47 - Introduction to CDAQ (Compact DAQ)
- Lecture 48 - Software-in-Loop based Temperature Controller using CDAQ and LabVIEW

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

NPTEL Video Course - Electrical Engineering - NOC:Physical Modelling for Electronics Enclosures using Rapid p

Subject Co-ordinator - Prof. N. V Chalapathi Rao

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Products prototyping  
Lecture 2 - Prototype concepts  
Lecture 3 - Physical simulation  
Lecture 4 - Rapid Prototyping  
Lecture 5 - Products detailing  
Lecture 6 - Advantages of Design Modelling  
Lecture 7 - Sample product concept  
Lecture 8 - Product sample exercise 1  
Lecture 9 - Exercise in product sample 2  
Lecture 10 - Integration of components 1  
Lecture 11 - Components integration in models  
Lecture 12 - 3D printing detail 1  
Lecture 13 - 3D printing detail 2  
Lecture 14 - 3D print assembly design  
Lecture 15 - Heat spreader to 3D print  
Lecture 16 - Metallic, 3D, build up 1  
Lecture 17 - 3D build up 2  
Lecture 18 - 3D design 1 from Photo snap  
Lecture 19 - 3D design 2 from Photo snap  
Lecture 20 - 3D Laser cuts 1, prints  
Lecture 21 - 3D Laser cuts 2, open source public prints  
Lecture 22 - Demo of 3D Part print  
Lecture 23 - Building a model 1  
Lecture 24 - Building a model 2  
Lecture 25 - Common place objects  
Lecture 26 - Materials  
Lecture 27 - Future 3D In biology  
Lecture 28 - Product clamp variants  
Lecture 29 - Product clamp build up

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

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- Lecture 30 - Multi direction features
- Lecture 31 - Multi direction features (Continued...)
- Lecture 32 - Fastening detail
- Lecture 33 - Flat objects
- Lecture 34 - Modularity
- Lecture 35 - Creative design work
- Lecture 36 - Creative designs
- Lecture 37 - Using flat features
- Lecture 38 - Organic shapes
- Lecture 39 - Simulation for alternate use

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

NPTEL Video Course - Electrical Engineering - NOC:Recent Advances in Transmission Insulators

Subject Co-ordinator - Prof Subba Reddy B

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to Transmission and distribution Insulators
- Lecture 2 - Manufacturing process for Ceramic/glass Insulators
- Lecture 3 - Manufacturing process for Polymeric Insulators
- Lecture 4 - Design Considerations of Transmission Insulators
- Lecture 5 - Field experience of Ceramic/Glass and Polymeric Insulators
- Lecture 6 - Comparison of Transmission Insulators
- Lecture 7 - Environmental issues with transmission Insulators
- Lecture 8 - Reliability and Philosophy of Testing
- Lecture 9 - Testing of Ceramic, Glass and Composite Insulators
- Lecture 10 - Cleaning methods adopted for Insulators
- Lecture 11 - Cleaning methods adopted for Insulators (Continued...)
- Lecture 12 - Coating techniques for Insulators
- Lecture 13 - Introduction to Hybrid Insulators

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

NPTEL Video Course - Electrical Engineering - NOC:Fundamentals of Semiconductor Devices

Subject Co-ordinator - Prof. Digbijoy N. Nath

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to semiconductors
- Lecture 2 - Introduction to energy bands
- Lecture 3 - Fundamentals of band structure
- Lecture 4 - Band structure (Continued...) and Fermi-Dirac distribution
- Lecture 5 - Density of states
- Lecture 6 - Doping and intrinsic carrier concentration
- Lecture 7 - Equilibrium carrier concentration
- Lecture 8 - Temperature-dependence of carrier concentration
- Lecture 9 - High doping effects and incomplete ionization
- Lecture 10 - Carrier scattering and mobility
- Lecture 11 - Low-field and high-field transport, introduction to diffusion
- Lecture 12 - Drift-diffusion and trap statistics
- Lecture 13 - Current continuity equation
- Lecture 14 - Continuity equation (Continued...) and introduction to p-n junction
- Lecture 15 - p-n junction under equilibrium
- Lecture 16 - p-n junction under equilibrium (Continued...)
- Lecture 17 - p-n junction under bias
- Lecture 18 - p-n junction under bias (Continued...)
- Lecture 19 - p-n junction
- Lecture 20 - Application of p-n junctions
- Lecture 21 - Breakdown of junction and C-V profiling
- Lecture 22 - Introduction to Schottky junction
- Lecture 23 - Schottky junction under equilibrium
- Lecture 24 - Schottky junction under bias
- Lecture 25 - Introduction to transistors
- Lecture 26 - Basics of BJT
- Lecture 27 - Working of BJT
- Lecture 28 - Working of BJT (Continued...)
- Lecture 29 - Delays in BJT

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

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- Lecture 30 - MOS
- Lecture 31 - MOS
- Lecture 32 - Ideal MOS system
- Lecture 33 - MOS C-V in more details
- Lecture 34 - MOSFET - An introduction
- Lecture 35 - Gradual Channel Approximation
- Lecture 36 - Substrate bias effect and subthreshold conduction in MOSFET
- Lecture 37 - Short Channel Effects in MOSFET
- Lecture 38 - Introduction to compound semiconductors
- Lecture 39 - Basics of heterojunctions
- Lecture 40 - Band diagram of heterojunctions
- Lecture 41 - Heterojunctions (Continued....)
- Lecture 42 - Heterojunction transistors
- Lecture 43 - III-nitrides
- Lecture 44 - Solar cell basics
- Lecture 45 - Solar cell (Continued...)
- Lecture 46 - Solar cell
- Lecture 47 - Basics of photodetectors
- Lecture 48 - Photodetectors
- Lecture 49 - Junction photodetectors
- Lecture 50 - Basics of recombination
- Lecture 51 - Basics of LED
- Lecture 52 - LED
- Lecture 53 - Visible LED
- Lecture 54 - Transistors for power electronics
- Lecture 55 - Transistors for power electronics (Continued...) and for RF electronics
- Lecture 56 - Transistors for RF (Continued...) and transistors for Memory
- Lecture 57 - Basics of microelectronic fabrication
- Lecture 58 - Microelectronic fabrication (Continued...)
- Lecture 59 - Summary

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

NPTEL Video Course - Electrical Engineering - NOC:Advanced IOT Applications

Subject Co-ordinator - Prof. T V Prabhakar

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Overview of localization using IoT sensors
- Lecture 2 - Outdoor localization without GPS - I
- Lecture 3 - Outdoor localization without GPS - II
- Lecture 4 - Outdoor localization using elevation - pressure mapping
- Lecture 5 - Localization using IMU sensors - I
- Lecture 6 - Localization using IMU sensors - II
- Lecture 7 - Localization using IMU sensors - III
- Lecture 8 - RFID based localization - I
- Lecture 9 - RFID based localization - II
- Lecture 10 - Simulation of simple algorithms for object detection
- Lecture 11 - Building smart vehicle for collision avoidance
- Lecture 12 - Basic computer vision algorithms - Part 1
- Lecture 13 - Basic computer vision algorithms - Part 2
- Lecture 14 - Code walkthrough of computer vision algorithm
- Lecture 15 - Introduction to LiDAR
- Lecture 16 - Range estimation and Obstacle avoidance
- Lecture 17 - Introduction to vehicle platooning
- Lecture 18 - Building blocks for autonomous vehicles - 1
- Lecture 19 - Building blocks for autonomous vehicles - 2
- Lecture 20 - On Board Diagnostics and protocols
- Lecture 21 - Diagnostic services and fuel-injection ratio control unit
- Lecture 22 - Real time event processing and Anomaly detection
- Lecture 23 - OBD-II and stream processing demonstration
- Lecture 24 - Speech recognition - Part 1
- Lecture 25 - Speech recognition - Part 2
- Lecture 26 - Speech recognition - Part 3
- Lecture 27 - Speech recognition - Part 4
- Lecture 28 - Device Security - Part 1
- Lecture 29 - Device Security - Part 2

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

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- Lecture 30 - Device Security - Part 3
- Lecture 31 - Need for air quality monitoring
- Lecture 32 - Air quality
- Lecture 33 - Introduction to air quality sensors
- Lecture 34 - Calibration techniques for IoT air quality sensors
- Lecture 35 - Sensor types
- Lecture 36 - Air quality
- Lecture 37 - Air quality
- Lecture 38 - Air quality
- Lecture 39 - Air quality
- Lecture 40 - Introduction to First Responder networks
- Lecture 41 - First Responders - Applications - Part 1
- Lecture 42 - First Responders - Applications - Part 2
- Lecture 43 - Cargo monitoring for tamper detection - Part 1
- Lecture 44 - Cargo monitoring for tamper detection - Part 2

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

NPTEL Video Course - Electrical Engineering - NOC:Electronic Systems for Cancer Diagnosis

Subject Co-ordinator - Prof. Hardik Jeetendra Pandya

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Tissue and Cell Culture Techniques

Lecture 2 - Tissue and Cell Culture Techniques

Lecture 3 - Tissue and Cell Culture Techniques

Lecture 4 - Cleanroom Equipments

Lecture 5 - Cleanroom Equipments (Continued...)

Lecture 6 - Introduction to photolithography

Lecture 7 - Photolithography

Lecture 8 - Photolithography

Lecture 9 - Micromachining Techniques

Lecture 10 - Breast Cancer and Oral Cancer Statistics

Lecture 11 - Fabrication of MEMs-based Biochip for cancer diagnosis

Lecture 12 - Fabrication of MEMs-based Biochip for cancer diagnosis (Continued...)

Lecture 13 - Fabrication of Piezoresistive Sensor

Lecture 14 - Fabrication of Piezoresistive Sensor (Continued...)

Lecture 15 - Fabrication of SU-8 pillar on piezoresistive Sensor

Lecture 16 - Portable Cancer Diagnostic Tool Using a Disposable MEMS-Based Biochip

Lecture 17 - Mechanical Phenotyping of Breast Cancer using MEMS

Lecture 18 - Electrical characterization of Breast Tissue Cores

Lecture 19 - Fabrication of MEMS-based sensor for electro-mechanical phenotyping of breast cancer

Lecture 20 - Fabrication of electro-mechanical sensor (Continued...)

Lecture 21 - Assembly of the electro-mechanical sensor

Lecture 22 - Silicon substrate devices for breast cancer diagnosis

Lecture 23 - Understanding the methods and mechanism to study cell morphology

Lecture 24 - Cytology - A detail study on Spin Coater and Cytospin

Lecture 25 - Techniques in oral cytology studies

Lecture 26 - Techniques in cell morphology analysis

Lecture 27 - Comparative study on diagnostic tools for oral cancer screening

Lecture 28 - Basic building blocks of Electronics System

Lecture 29 - Basic building blocks of Electronics System

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

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- Lecture 30 - Basic building blocks of Electronics System
- Lecture 31 - Basic building blocks of Electronics System
- Lecture 32 - Basic building blocks of Electronics System
- Lecture 33 - Basic building blocks of Electronics System
- Lecture 34 - Basic building blocks of Electronics System
- Lecture 35 - Basic building blocks of Electronics System
- Lecture 36 - Basic building blocks of Electronics System
- Lecture 37 - Etching Process and Figure of Merits
- Lecture 38 - ECG Signal Processing to calculate BPM
- Lecture 39 - ECG Signal Processing to calculate BPM (Continued...)
- Lecture 40 - ECG Signal Processing to calculate BPM (Continued...)
- Lecture 41 - ECG Signal Processing to calculate BPM (Continued...)
- Lecture 42 - ECG Signal Processing to calculate BPM (Continued...)
- Lecture 43 - ECG Signal Processing to calculate BPM [Continued...)
- Lecture 44 - MEMS based Force Sensor for Catheter Contact Force Measurement
- Lecture 45 - 3D Printing
- Lecture 46 - 3D Fabrication Techniques
- Lecture 47 - Gowning Procedure in Clean Room
- Lecture 48 - Introduction to Equipments
- Lecture 49 - PDMS Moulding procedure
- Lecture 50 - Introduction to Equipments
- Lecture 51 - Introduction to Equipments
- Lecture 52 - Micromanipulator
- Lecture 53 - Biosafety Cabinet and Ultrasonicbath
- Lecture 54 - Incubator Shaker
- Lecture 55 - Hotplate and Microcentrifuge
- Lecture 56 - Autoclave
- Lecture 57 - Impedance Analyser
- Lecture 58 - Rapid Prototyping using 3D Printer
- Lecture 59 - Etching Process
- Lecture 60 - Electronic System for Drug Screening
- Lecture 61 - Introduction to Equipments
- Lecture 62 - Introduction to Equipments
- Lecture 63 - Electronic Module for Gas sensor
- Lecture 64 - Fabrication process flow for a metal oxide gas sensor
- Lecture 65 - MEMS Simulation using Comsol Multiphysics
- Lecture 66 - Introduction to COMSOL Multiphysics
- Lecture 67 - COMSOL Examples for MEMS Applications
- Lecture 68 - COMSOL Examples for MEMS Applications (Continued...)

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

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- Lecture 69 - Demonstration of Thermal Acuator and Understanding of Application Builder
- Lecture 70 - Closed loop control of temperature sensor
- Lecture 71 - Experimental Set-up of closed loop control of temperature sensor

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

NPTEL Video Course - Electrical Engineering - NOC:Electronic Modules for Industrial Applications using Op-Amp

Subject Co-ordinator - Prof. Hardik Jeetendra Pandya

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction to Op-amp

Lecture 2 - Introduction Wafer Manufacturing Process and Clean room Protocols

Lecture 3 - Introduction to Fabrication Process Technology and Op-amp

Lecture 4 - Op-amp Characteristics and Datasheet Parameters

Lecture 5 - Overview of Active Filters and Oscillators

Lecture 6 - Overview of Op-amp Oscillators

Lecture 7 - Introduction to ECG Experiment

Lecture 8 - Design and Implementation of ECG Preprocessing Stage - Part 1

Lecture 9 - Design and Implementation of ECG Preprocessing Stage - Part 2

Lecture 10 - Design and Implementation of ECG Preprocessing Stage - Part 3

Lecture 11 - Design and Implementation of ECG Preprocessing Stage - Part 4

Lecture 12 - Design and Implementation of Peak Detector and Thresholding Circuit for ECG Signal Conditioning

Lecture 13 - Experiment

Lecture 14 - Application

Lecture 15 - Photolithography

Lecture 16 - Understanding the process of photolithography

Lecture 17 - Photolithography

Lecture 18 - Photolithography

Lecture 19 - Fabrication of Piezoresistive Sensor

Lecture 20 - Fabrication of MEMS based Catheter Contact Force Sensor

Lecture 21 - Design of Speed Control of DC Motor

Lecture 22 - Design of Speed Control of DC Motor

Lecture 23 - Design of Speed Control of DC Motor

Lecture 24 - Design of Speed Control of DC Motor

Lecture 25 - Design of Speed Control of DC Motor

Lecture 26 - Design of Speed Control of DC Motor

Lecture 27 - Design of Speed Control of DC Motor

Lecture 28 - Design of Speed Control of DC Motor

Lecture 29 - Design of Speed Control of a DC Motor using Op-amp

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

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- Lecture 30 - Design of Speed Control of a DC Motor using Op-amp
- Lecture 31 - Design of Speed Control of a DC Motor using DAQ - Part 1
- Lecture 32 - Design of Speed Control of a DC Motor using DAQ - Part 2
- Lecture 33 - Design of Speed Control of a DC Motor using DAQ - Part 3
- Lecture 34 - Introduction to Hot-Wire Anemometer
- Lecture 35 - Signal-conditioning Circuit for Hot-Wire Anemometer
- Lecture 36 - Signal-conditioning Circuit for Hot-Wire Anemometer Part 2
- Lecture 37 - Signal-conditioning Circuit for Hot-Wire Anemometer
- Lecture 38 - Signal-conditioning Circuit for Hot-Wire Anemometer
- Lecture 39 - Introduction to Gas Sensors
- Lecture 40 - Fabrication Process for Gas Sensor
- Lecture 41 - Signalconditioning Circuit for Operating Heater Voltage of MQ-7 Gas Sensor - Part 1
- Lecture 42 - Signalconditioning Circuit for Operating Heater Voltage of MQ-7 Gas Sensor - Part 2
- Lecture 43 - Signalconditioning Circuit for Operating Heater Voltage of MQ-7 Gas Sensor - Part 3
- Lecture 44 - Fundamentals of Electrophysiological signals
- Lecture 45 - Fundamentals of EEG Signal
- Lecture 46 - Application of EEG Signal for Detection of Hearing Loss
- Lecture 47 - Closed loop control of temperature using DAQ and LabVIEW
- Lecture 48 - Experimental Set-up of closed loop control of temperature sensor
- Lecture 49 - Introduction to MEMS Simulation using Comsol Multiphysics
- Lecture 50 - Introduction to COMSOL Multiphysics
- Lecture 51 - COMSOL Examples for MEMS Applications
- Lecture 52 - COMSOL Examples for MEMS Applications (Continued...)
- Lecture 53 - Demonstration of Thermal Actuator and Understanding of Application Builder



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

NPTEL Video Course - Electrical Engineering - NOC:Sensors and Actuators

Subject Co-ordinator - Prof. Hardik Jeetendra Pandya

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Sensors - Part 1  
Lecture 2 - Sensors - Part 2  
Lecture 3 - Sensors - Part 3  
Lecture 4 - Sensors - Part 4  
Lecture 5 - Sensors - Part 5  
Lecture 6 - Recent Microsensors based system  
Lecture 7 - Recent Microsensors based system  
Lecture 8 - Microfabrication Basics  
Lecture 9 - Introduction to cleanroom  
Lecture 10 - Cleanroom Protocols  
Lecture 11 - Introduction to Cleanroom Equipments  
Lecture 12 - Fabrication Process Flow of Microheater and Micromachining  
Lecture 13 - Wafer Bonding and PDMS moulding  
Lecture 14 - Overview of MEMS based sensors  
Lecture 15 - Introduction to Cleanroom Equipments  
Lecture 16 - Introduction to Cleanroom Equipments  
Lecture 17 - Process Sensor Process Flow, Cell based Diagnosis Device  
Lecture 18 - Basics of Patterning and Drug Screening Device  
Lecture 19 - MEMS applications in automobile system  
Lecture 20 - Arduino Interfacing for Sensors and Actuators  
Lecture 21 - Demonstration of DC Motor as an actuator  
Lecture 22 - Demonstration of peristaltic pump using Arduino  
Lecture 23 - Demonstration of PDMS Patterning  
Lecture 24 - Crystal Orientation and Si-SiO<sub>2</sub> interface  
Lecture 25 - Surface Profilometry and Physical Vapour Deposition Techniques  
Lecture 26 - Introduction to COMSOL Multiphysics and Modelling Examples  
Lecture 27 - Demonstration of Thermal Actuators using COMSOL  
Lecture 28 - Demonstration of MQ3 Gas sensor using Arduino  
Lecture 29 - Photolithography - Part 1

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

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- Lecture 30 - Signal Conditioning Circuit for Temperature Sensors
- Lecture 31 - Demonstration of Microheaters in COMSOL Multiphysics
- Lecture 32 - Introduction to Cleanroom facilities for biomedical applications
- Lecture 33 - Physical Deposition Techniques
- Lecture 34 - Demonstration on peristaltic pump in cleanroom
- Lecture 35 - Installation of Oxygen Plasma System
- Lecture 36 - Demonstration of IR Based Sensor using Arduino
- Lecture 37 - Illustration of fabricated Microfluidic Device for biochips with PDMS moulding
- Lecture 38 - Photolithography - Part 2
- Lecture 39 - Photolithography - Part 3
- Lecture 40 - Introduction and Demonstration of Shape Memory Alloy
- Lecture 41 - Applications of Shape Memory Alloy as a light weight actuators
- Lecture 42 - Discussion on Fabricated Sensor with Silicon as Substrate
- Lecture 43 - Discussion and Microscopic Inspection of Fabricated Sensor with Silicon as a Substrate
- Lecture 44 - Tissue Deparaffinization for Biosensors
- Lecture 45 - Clean room guidelines and Cancer Diagnostic tool
- Lecture 46 - Basics of Pressure Sensor and Demonstration using Arduino Microcontroller
- Lecture 47 - Basics of Stepper Motor and Demonstration using Arduino Microcontroller
- Lecture 48 - Microscopic Inspection of Diced wafers and CNT Sensing Layer for fabricated sensor
- Lecture 49 - Process flow for Microcantilever for Mechanical Phenotyping of breast cancer tissues
- Lecture 50 - Applications of microcantilever for Mechanical Phenotyping of breast cancer tissues
- Lecture 51 - Installation and Introduction to Physical Vapour Deposition System
- Lecture 52 - Human Machine Interface for Controlling Deposition System
- Lecture 53 - Flexible MEMS for phenotyping tissue properties - I
- Lecture 54 - Flexible MEMS for phenotyping tissue properties - II
- Lecture 55 - System Demonstration for Physical Vapor Deposition
- Lecture 56 - Introduction to CAD Modelling - I
- Lecture 57 - Introduction to CAD Modelling - II
- Lecture 58 - Biosensors for ETM Phenotyping of breast cancer tissues for better prognosis
- Lecture 59 - Biosensors for Electrothermal sensor
- Lecture 60 - MEMS based sensor for catheter contact force measurement
- Lecture 61 - Microfluidics based Drug Screening
- Lecture 62 - Basic aspects of 3D Printing
- Lecture 63 - 3D Printing Materials and Demonstration of Remote 3D Printing

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

NPTEL Video Course - Electrical Engineering - NOC:Neural Networks for Signal Processing-I

Subject Co-ordinator - Prof. Shayan Srinivasa Garani

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - The human brain
- Lecture 2 - Introduction to Neural Networks
- Lecture 3 - Models of a neuron
- Lecture 4 - Feedback and network architectures
- Lecture 5 - Knowledge representation
- Lecture 6 - Prior information and invariances
- Lecture 7 - Learning processes
- Lecture 8 - Perceptron - 1
- Lecture 9 - Perceptron - 2
- Lecture 10 - Batch perceptron algorithm
- Lecture 11 - Perceptron and Bayes classifier
- Lecture 12 - Linear regression - 1
- Lecture 13 - Linear regression - 2
- Lecture 14 - Linear regression - 3
- Lecture 15 - Logistic regression
- Lecture 16 - Multi-layer perceptron - 1
- Lecture 17 - Multi-layer perceptron - 2
- Lecture 18 - Back propagation - 1
- Lecture 19 - Back propagation - 2
- Lecture 20 - XOR problem
- Lecture 21 - Universal approximation function
- Lecture 22 - Complexity Regularization and Cross validation
- Lecture 23 - Convolutional Neural Networks (CNN)
- Lecture 24 - Cover's Theorem
- Lecture 25 - Multivariate interpolation problem
- Lecture 26 - Radial basis functions (RBF)
- Lecture 27 - Recursive least squares algorithm
- Lecture 28 - Comparison of RBF with MLP
- Lecture 29 - Kernel regression using RBFs

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

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- Lecture 30 - Kernel Functions
- Lecture 31 - Basics of constrained optimization
- Lecture 32 - Optimization with equality constraint
- Lecture 33 - Optimization with inequality constraint
- Lecture 34 - Support Vector Machines (SVM)
- Lecture 35 - Optimal hyperplane for linearly separable patterns
- Lecture 36 - Quadratic optimization for finding optimal hyperplane
- Lecture 37 - Optimal hyperplane for non-linearly separable patterns
- Lecture 38 - Inner product kernel and Mercer's theorem
- Lecture 39 - Optimal design of an SVM
- Lecture 40 -  $\mu$ -insensitive loss function
- Lecture 41 - XOR problem revisited using SVMs
- Lecture 42 - Hilbert Space
- Lecture 43 - Reproducing Kernel Hilbert Space
- Lecture 44 - Representer Theorem
- Lecture 45 - Generalized applicability of the representer theorem
- Lecture 46 - Regularization Theory
- Lecture 47 - Euler-Lagrange Equation
- Lecture 48 - Regularization Networks
- Lecture 49 - Generalized RBF networks
- Lecture 50 - XOR problem revisited using RBF
- Lecture 51 - Structural Risk Minimization
- Lecture 52 - Bias-Variance Dilemma
- Lecture 53 - Estimation of regularization parameters
- Lecture 54 - Basics of L1 regularization
- Lecture 55 - Grafting
- Lecture 56 - Kernel PCA
- Lecture 57 - Hebbian based maximum eigen filter - 1
- Lecture 58 - Hebbian based maximum eigen filter - 2
- Lecture 59 - Hebbian based maximum eigen filter - 3
- Lecture 60 - VC dimension
- Lecture 61 - Autoencoders
- Lecture 62 - Denoising Autoencoders
- Lecture 63 - Demo - Perceptron
- Lecture 64 - Demo - Motivation for CNN
- Lecture 65 - Back propagation in Convolutional Neural Network
- Lecture 66 - Ethics in AI research and coverage summary

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

NPTEL Video Course - Electrical Engineering - NOC:Electronics Equipment Integration and Prototype Building

Subject Co-ordinator - Prof. N.V.Chalapathi Rao

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to electronics products
- Lecture 2 - Examples from real life
- Lecture 3 - Common Simulation of flat prismatic parts
- Lecture 4 - Common flat parts enclosures
- Lecture 5 - Real life parts to scale on a graph
- Lecture 6 - Early First steps
- Lecture 7 - Top down, outside to internals
- Lecture 8 - Using a print and fabrication video
- Lecture 9 - Details of displays and keys
- Lecture 10 - Improvement on marking and skill
- Lecture 11 - Mass production in sheet metal
- Lecture 12 - Prototyping of user interfaces for concepts
- Lecture 13 - Stacking of equipment to make a system
- Lecture 14 - Recapitulating a sub system
- Lecture 15 - Off the shelf enclosures and making a user interface
- Lecture 16 - Looking around for concepts and integration
- Lecture 17 - Representation on paper
- Lecture 18 - Example features of surfaces and solids
- Lecture 19 - Simple and curved surfaces
- Lecture 20 - Describing inclined surfaces
- Lecture 21 - Basics of engineering Drawing
- Lecture 22 - Introduction to sizing and fits
- Lecture 23 - Practical mechanical assemblies
- Lecture 24 - Analogous Mechanical - Electronics detailing
- Lecture 25 - Solid modelling
- Lecture 26 - Importance of dimensioning
- Lecture 27 - Ease of editing redesign
- Lecture 28 - Dimensioning of electronics components
- Lecture 29 - 2D flat representation

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

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- Lecture 30 - Electronics to Mechanical interfacing
- Lecture 31 - Complexity of 3D assemblies with wiring
- Lecture 32 - Illustrative simple design
- Lecture 33 - Practical detailing
- Lecture 34 - Rendered on screen
- Lecture 35 - Fastenings and hardware
- Lecture 36 - Fastener representation, detailing
- Lecture 37 - Practical detailing.
- Lecture 38 - Recapitulation, context of course
- Lecture 39 - Low cost is the key

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

NPTEL Video Course - Electrical Engineering - NOC:Design and Simulation of Power Conversion using Open Source

Subject Co-ordinator - Prof. L. Umanand

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Getting started with NgSpice  
Lecture 2 - Refractoring the .cir  
Lecture 3 - Sub-circuits  
Lecture 4 - gschem and netlist generation  
Lecture 5 - Setting up for simulation with Octave  
Lecture 6 - Getting started with equation based simulation  
Lecture 7 - Resuming a simulation in Octave  
Lecture 8 - PV cell model - review  
Lecture 9 - PV cell characteristic - review  
Lecture 10 - PV cell - symbol and subcircuit  
Lecture 11 - Rectifier-capacitor filter - operation review  
Lecture 12 - Rectifier-capacitor filter - NgSpice simulation  
Lecture 13 - Rectifier-capacitor filter with non-idealities  
Lecture 14 - 3 phase Rectifier-capacitor filter  
Lecture 15 - Equation based simulation in Octave  
Lecture 16 - Passive power factor improvement - review  
Lecture 17 - Passive power factor circuit in NgSpice  
Lecture 18 - Buck converter - review  
Lecture 19 - Buck converter - NgSpice  
Lecture 20 - Boost converter - review  
Lecture 21 - Boost converter - NgSpice  
Lecture 22 - Buck-boost converter - review  
Lecture 23 - Buck-boost converter - NgSpice  
Lecture 24 - Equation based simulation of converters  
Lecture 25 - Forward Converter - review  
Lecture 26 - Forward Converter simulation  
Lecture 27 - Understanding Core flux reset  
Lecture 28 - Core flux reset - simulation  
Lecture 29 - Flyback converter - review

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

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- Lecture 30 - Flyback converter - simulation
- Lecture 31 - Pushpull converter - review
- Lecture 32 - Pushpull converter - simulation
- Lecture 33 - Half bridge converter - review
- Lecture 34 - Half bridge converter - simulation
- Lecture 35 - Full bridge converter - review
- Lecture 36 - Full bridge converter - simulation
- Lecture 37 - Close loop operation
- Lecture 38 - Close loop with feed forward control
- Lecture 39 - NgSpice simulation of close loop control
- Lecture 40 - Battery charging with current control
- Lecture 41 - Slope compensation for current control
- Lecture 42 - NgSpice simulation of battery charging
- Lecture 43 - Single phase PWM for single phase inverter
- Lecture 44 - NgSpice simulation of single phase PWM
- Lecture 45 - 2-axes theory for 3-phase systems
- Lecture 46 - Transformations for 2 and 3 axes systems
- Lecture 47 - Maximum power point tracking - NgSpice
- Lecture 48 - Space vector PWM - digital
- Lecture 49 - Space vector PWM - analog
- Lecture 50 - SVPWM analog - NgSpice simulation
- Lecture 51 - Induction motor model
- Lecture 52 - Induction motor simulation in Octave
- Lecture 53 - V/F control of induction motor - NgSpice



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

NPTEL Video Course - Electrical Engineering - NOC: Introductory Neuroscience and Neuro-Instrumentation

Subject Co-ordinator - Prof. Mahesh Jayachandra

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Cellular (Microscopic) Structure of the Central Nervous System (CNS)
- Lecture 2 - Anatomical (Macroscopic) structure of the CNS
- Lecture 3 - Introduction to Cleanroom and IC Fabrication Techniques
- Lecture 4 - Introduction to EEG applications for Hearing Loss
- Lecture 5 - Electrophysiological Recordings
- Lecture 6 - Neocortical Circuits
- Lecture 7 - The resting Membrane Potential
- Lecture 8 - Applications of MEMS Fabrication Technologies
- Lecture 9 - Fundamentals of biopotentials and applications
- Lecture 10 - Fundamentals of EEG and applications
- Lecture 11 - The Action Potential (1)
- Lecture 12 - The Action Potential (2)
- Lecture 13 - Axonology, Neuronal Biophysics (1)
- Lecture 14 - Axonology, Neuronal Biophysics (2)
- Lecture 15 - Experimental Setup for EEG Recording
- Lecture 16 - Introduction to Cleanroom Protocols and Demonstration of Gowning Procedure
- Lecture 17 - Electromagnetic Stimulation of the Brain (1)
- Lecture 18 - Electromagnetic Stimulation of the Brain (2)
- Lecture 19 - Introduction to Event Related Potentials
- Lecture 20 - Introduction to 3D Printing
- Lecture 21 - 3D Printing
- Lecture 22 - Introduction to Event Related Potentials (2)
- Lecture 23 - Different Event Related Potentials (1)
- Lecture 24 - Different Event Related Potentials (2)
- Lecture 25 - Introduction to Silicone Wafer Processing Techniques
- Lecture 26 - Basics of Silicone Dioxide
- Lecture 27 - Inverse Problem, EEG source localization (1)
- Lecture 28 - Inverse Problem, EEG source localization (2)
- Lecture 29 - Introduction to Brain Computer Interfaces

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

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- Lecture 30 - Signal Conditioning Circuit for EEG Bioamplifiers
- Lecture 31 - Basics of BCI Experimentation
- Lecture 32 - Different Brain Computer Interfaces
- Lecture 33 - Introduction to EEGLAB, ERPLAB and AEP Demonstration (1)
- Lecture 34 - Introduction to EEGLAB, ERPLAB and AEP Demonstration (2)
- Lecture 35 - Introduction to Photolithography
- Lecture 36 - Basics of BCI Experimentation
- Lecture 37 - MMN Demonstration with EEGLAB and ERPLAB (1)
- Lecture 38 - MMN Demonstration with EEGLAB and ERPLAB (2)
- Lecture 39 - Introduction to Photolithography (2)
- Lecture 40 - Basics of Instrumentation Amplifier and Online Simulation
- Lecture 41 - Basics of BCI Experimentation
- Lecture 42 - P300 Demonstration with EEGLAB/ERPLAB (1)
- Lecture 43 - P300 Demonstration with EEGLAB/ERPLAB (2)
- Lecture 44 - Wavelet Analysis with VEP (1)
- Lecture 45 - Details of Lithography, E-beam Lithography and Mask Aligner
- Lecture 46 - Basics of BCI Experimentation
- Lecture 47 - Wavelet Analysis with VEP (2)
- Lecture 48 - Demonstration
- Lecture 49 - Demonstration
- Lecture 50 - Photoresist (SU-8) and soft lithography
- Lecture 51 - Physical Vapour Deposition
- Lecture 52 - Introduction to Epilepsy and Classification
- Lecture 53 - Epileptogenesis
- Lecture 54 - Demonstration
- Lecture 55 - Demonstration
- Lecture 56 - Demonstration
- Lecture 57 - Demonstration
- Lecture 58 - Physical Vapour Deposition
- Lecture 59 - Physical Vapour Deposition
- Lecture 60 - Recent Trends
- Lecture 61 - Demonstration
- Lecture 62 - Basics of EEG, ERP and acquisition
- Lecture 63 - Photolithography with example
- Lecture 64 - Stress Tissue Analysis using COMSOL Multiphysics
- Lecture 65 - Recent Trends

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

NPTEL Video Course - Electrical Engineering - NOC:Information Theory

Subject Co-ordinator - Prof. Himanshu Tyagi

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - What is information?

Lecture 2 - How to model uncertainty?

Lecture 3 - Basic concepts of probability

Lecture 4 - Estimates of random variables

Lecture 5 - Limit theorems

Lecture 6 - Review

Lecture 7 - Source model

Lecture 8 - Motivating examples

Lecture 9 - A compression problem

Lecture 10 - Shannon entropy

Lecture 11 - Random hash

Lecture 12 - Review 2

Lecture 13 - Uncertainty and randomness

Lecture 14 - Total variation distance

Lecture 15 - Generating almost random bits

Lecture 16 - Generating samples from a distribution using uniform randomness

Lecture 17 - Typical sets and entropy

Lecture 18 - Review 3

Lecture 19 - Hypothesis testing and estimation

Lecture 20 - Examples

Lecture 21 - The log-likelihood ratio test

Lecture 22 - Kullback-Leibler divergence and Stein's lemma

Lecture 23 - Properties of KL divergence

Lecture 24 - Review 4

Lecture 25 - Information per coin-toss

Lecture 26 - Multiple hypothesis testing

Lecture 27 - Error analysis of multiple hypothesis testing

Lecture 28 - Mutual information

Lecture 29 - Fano's inequality

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

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- Lecture 30 - Measures of information
- Lecture 31 - Chain rules
- Lecture 32 - Shape of measures of information
- Lecture 33 - Data processing inequality
- Lecture 34 - Midyear Review
- Lecture 35 - Proof of Fano's inequality
- Lecture 36 - Variational formulae
- Lecture 37 - Capacity as information radius
- Lecture 38 - Proof of Pinsker's inequality
- Lecture 39 - Continuity of entropy
- Lecture 40 - Lower bound for compression
- Lecture 41 - Lower bound for hypothesis testing
- Lecture 42 - Review 7
- Lecture 43 - Lower bound for random number generation
- Lecture 44 - Strong converse
- Lecture 45 - Lower bound for minmax statistical estimation
- Lecture 46 - Variable length source codes
- Lecture 47 - Review 8
- Lecture 48 - Kraft's inequality
- Lecture 49 - Shannon code
- Lecture 50 - Huffman code
- Lecture 51 - Minmax Redundancy
- Lecture 52 - Type based universal compression
- Lecture 53 - Review 9
- Lecture 54 - Arithmetic code
- Lecture 55 - Online probability assignment
- Lecture 56 - Compression of databases
- Lecture 57 - Compression of databases
- Lecture 58 - Repetition code
- Lecture 59 - Channel capacity
- Lecture 60 - Sphere packing bound for BSC
- Lecture 61 - Random coding bound for BSC
- Lecture 62 - Random coding bound for general channel
- Lecture 63 - Review 11
- Lecture 64 - Converse proof for channel coding theorem
- Lecture 65 - Additive Gaussian Noise channel
- Lecture 66 - Mutual information and differential entropy
- Lecture 67 - Channel coding theorem for Gaussian channel
- Lecture 68 - Parallel channels and water-filling

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

NPTEL Video Course - Electrical Engineering - NOC:Photonic Integrated Circuit

Subject Co-ordinator - Prof. Shankar Kumar Selvaraja

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Photonic integrated circuits course introduction  
Lecture 2 - Wave optics review  
Lecture 3 - Electromagnetic theory review - 1  
Lecture 4 - Electromagnetic theory review - 2  
Lecture 5 - Photonic integrated circuits: an introduction  
Lecture 6 - Photonic integrated circuits evolution  
Lecture 7 - Photonic integrated circuit components - 1  
Lecture 8 - Photonic integrated circuit components - 2  
Lecture 9 - Dispersion  
Lecture 10 - Phase velocity and Group velocity  
Lecture 11 - Anisotropic medium and reciprocity  
Lecture 12 - Polarisation in anisotropic medium  
Lecture 13 - Optical axes  
Lecture 14 - Waveguide structure  
Lecture 15 - Waveguide modes - 1  
Lecture 16 - Waveguide modes - 2  
Lecture 17 - Field Equation  
Lecture 18 - Guided modes in symmetric slab waveguides  
Lecture 19 - Waveguide design - Boundary value formulation  
Lecture 20 - Waveguide design - BVP solution  
Lecture 21 - Waveguide design - Perturbation approach  
Lecture 22 - Waveguide design - Effective Index method  
Lecture 23 - Coupled mode theory - 1  
Lecture 24 - Coupled mode theory - 2  
Lecture 25 - Two-mode coupling  
Lecture 26 - Co and counter propagating mode coupling  
Lecture 27 - Phase matching  
Lecture 28 - Directional coupler  
Lecture 29 - Y-splitter

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

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- Lecture 30 - Multi-Mode Interference coupler
- Lecture 31 - MZI
- Lecture 32 - Micro-Ring Resonators
- Lecture 33 - Light-chip coupling
- Lecture 34 - End-fire coupling
- Lecture 35 - Light Modulator introduction
- Lecture 36 - Electro-Optic effect
- Lecture 37 - Waveguide modulator
- Lecture 38 - Optical transition in semiconductors
- Lecture 39 - Transition rates
- Lecture 40 - Absorption and gain in semiconductors
- Lecture 41 - Semiconductor Light Emitting Diodes
- Lecture 42 - Semiconductor Light Emitting Diodes (Continued...)
- Lecture 43 - Semiconductor Lasers
- Lecture 44 - Semiconductor photodetector
- Lecture 45 - Semiconductor photodetector noise
- Lecture 46 - Fabrication process - 1
- Lecture 47 - Fabrication process - 2
- Lecture 48 - PIC technology - Building a simple circuit
- Lecture 49 - PIC for communication
- Lecture 50 - PIC for sensing - 1
- Lecture 51 - PIC for sensing - 2

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

NPTEL Video Course - Electrical Engineering - NOC:Design for Internet of Things (2021)

Subject Co-ordinator - Prof. T V Prabhakar

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction and Definition of IoT  
Lecture 2 - Location, Applications, and Power  
Lecture 3 - Challenges - Part 1  
Lecture 4 - Challenges - Part 2  
Lecture 5 - Challenges - Part 3  
Lecture 6 - Challenges - Part 4  
Lecture 7 - Unique ID  
Lecture 8 - Introduction to RFID  
Lecture 9 - RFID DEMO  
Lecture 10 - RFID Theory - 1  
Lecture 11 - RFID Theory - 2  
Lecture 12 - RFID Theory - 3  
Lecture 13 - Energy harvesting - 1  
Lecture 14 - Energy harvesting - 2  
Lecture 15 - Energy harvesting - 3  
Lecture 16 - Power management systems - 1  
Lecture 17 - Power management systems - 2  
Lecture 18 - Battery life calculation  
Lecture 19 - Introduction to System Design for low power  
Lecture 20 - LDO - 1  
Lecture 21 - LDO - 2  
Lecture 22 - LDO - 3  
Lecture 23 - Buck converter - 1  
Lecture 24 - Buck converter - 2  
Lecture 25 - Lab experiment  
Lecture 26 - Introduction to Sensors and Actuators  
Lecture 27 - Sensors  
Lecture 28 - Actuators  
Lecture 29 - Case study on Sensing and Actuation

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

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- Lecture 30 - Introduction to low power software
- Lecture 31 - ADC driver design and development
- Lecture 32 - Power optimization
- Lecture 33 - Introduction to protocols
- Lecture 34 - MQTT - 1
- Lecture 35 - MQTT - 2
- Lecture 36 - COAP - 1
- Lecture 37 - COAP - 2
- Lecture 38 - Websockets
- Lecture 39 - Introduction to low power wireless - 1
- Lecture 40 - Introduction to low power wireless - 2
- Lecture 41 - Bluetooth low energy (BLE) - 1
- Lecture 42 - Bluetooth low energy (BLE) - 2
- Lecture 43 - IEEE 802.15.4e - 1
- Lecture 44 - IEEE 802.15.4e - 2
- Lecture 45 - IEEE 802.15.4e - 3
- Lecture 46 - Wi-Fi
- Lecture 47 - Introduction to Wide area technologies
- Lecture 48 - LoRa - 1
- Lecture 49 - LoRa - 2
- Lecture 50 - NBIoT, LTE-M
- Lecture 51 - BLE mesh technology
- Lecture 52 - Course conclusion



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

NPTEL Video Course - Electrical Engineering - NOC:Mathematical Aspects of Biomedical Electronic System Design

Subject Co-ordinator - Prof. Chandramani Singh

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction to Signals and Systems
- Lecture 2 - MATLAB Demo on Signal Types and Moving Average System
- Lecture 3 - Microfabrication Basics for Biomedical Systems
- Lecture 4 - Fluid Flow in Body Lumen
- Lecture 5 - Fourier Series
- Lecture 6 - Continuous Time Fourier Transform
- Lecture 7 - Biological Tissues as disordered systems
- Lecture 8 - Introduction to electrical equivalent circuit models for biological systems
- Lecture 9 - Discrete Time Fourier Transform and Sampling
- Lecture 10 - Percolation Theory and applications in biological tissues
- Lecture 11 - Electrical properties of cells and tissues revisited: Examples and Applications
- Lecture 12 - Linear Algebra - I
- Lecture 13 - MATLAB Live Demo on Moving average and signal acquisition
- Lecture 14 - Oxidation and Thickness Characterization
- Lecture 15 - Basics of Photolithography with Process flow examples
- Lecture 16 - Linear Algebra - II
- Lecture 17 - Introduction to Biomedical Optics
- Lecture 18 - Optical Properties of Tissues and Mathematical modelling
- Lecture 19 - System of Linear Equations
- Lecture 20 - Scaling Laws
- Lecture 21 - Thermal Properties of a tissue
- Lecture 22 - Introduction to Probability
- Lecture 23 - Tissue Electrode Interface
- Lecture 24 - Thermal Properties of a tissue and cells
- Lecture 25 - Probability: Random Variables and CDF
- Lecture 26 - Basics of Silicon, Silicon Dioxide for Microfabrication Process
- Lecture 27 - Mechanical Properties of human brain tissues and modelling
- Lecture 28 - Probability: Important measures and generating functions
- Lecture 29 - Near Infrared Spectroscopy and Ultrasound Techniques

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

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- Lecture 30 - Thermal Properties of Tissues and Modelling
- Lecture 31 - Multisim Simulations for Biomedical Signal Conditioning Circuit
- Lecture 32 - Cleanroom Entry Demonstration
- Lecture 33 - Spin Coating Demonstration
- Lecture 34 - Common Random Variables
- Lecture 35 - Introduction to signal Conditioning circuits for biomedical devices
- Lecture 36 - Signal Conditioning circuits units and design
- Lecture 37 - E Beam Evaporation System Demonstration
- Lecture 38 - Joint and Marginal Probability Distribution
- Lecture 39 - Temperature Sensor Interfacing Analysis
- Lecture 40 - Demo of Temperature data acquisition system using LabVIEW
- Lecture 41 - Recent Trends in Biomedical Electronic System Design
- Lecture 42 - Aspects of Biomedical Electronics System Design

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

NPTEL Video Course - Electrical Engineering - NOC:Concentration Inequalities

Subject Co-ordinator - Prof. Himanshu Tyagi

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Why study concentration inequalities?
- Lecture 2 - Chernoff bound
- Lecture 3 - Examples of Chernoff bound for common distributions
- Lecture 4 - Hoeffding and Bernstein inequalities
- Lecture 5 - Azuma and McDiarmid inequalities
- Lecture 6 - Bounding variance using the Efron-Stein inequality
- Lecture 7 - The Gaussian-Poincare inequality
- Lecture 8 - Tail bounds using the Efron-Stein inequality
- Lecture 9 - Herbst's argument and the entropy method
- Lecture 10 - Log-Sobolev inequalities
- Lecture 11 - Binary and Gaussian Log-Sobolev inequalities and concentration
- Lecture 12 - Variational formulae for Kullback-Leibler and Bregman Divergence
- Lecture 13 - A modified log-Sobolev inequality and concentration
- Lecture 14 - Introduction to the transportation method for showing concentration bounds
- Lecture 15 - Transportation lemma and a proof of McDiarmid's inequality using the transportation method
- Lecture 16 - Concentration bounds for functions beyond bounded difference using transportation method
- Lecture 17 - Marton's conditional transportation cost inequality
- Lecture 18 - Isoperimetry and concentration of measure
- Lecture 19 - Isoperimetry and bounded difference
- Lecture 20 - Equivalence of Stam's inequality and log Sobolev inequality
- Lecture 21 - An information theoretic proof of log Sobolev inequality
- Lecture 22 - Hypercontractivity and strong data processing inequality for Rényi divergence
- Lecture 23 - An information theoretic characterization of hypercontractivity
- Lecture 24 - Equivalence of Gaussian hypercontractivity and Gaussian log Sobolev inequality
- Lecture 25 - Uniform deviation bounds for random walks and the law of the iterated logarithm
- Lecture 26 - Self normalized concentration inequalities and application to online regression

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

NPTEL Video Course - Electrical Engineering - NOC:Real-Time Digital Signal Processing

Subject Co-ordinator - Prof. Rathna G N

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction  
Lecture 2 - Basics of Signal Processing  
Lecture 3 - Lab - CCS  
Lecture 4 - Number System  
Lecture 5 - Architecture - 1  
Lecture 6 - Architecture - 2  
Lecture 7 - Real-time Constraints  
Lecture 8 - FIR - Filters  
Lecture 9 - Pipelining and Parallel Processing for Low Power Applications - I  
Lecture 10 - Pipelining and Parallel Processing for Low Power Applications - II  
Lecture 11 - Lab: Sine Generation  
Lecture 12 - IIR Filters - 1  
Lecture 13 - IIR Filters - 2  
Lecture 14 - Lab: Sine Generation, FIR and IIR  
Lecture 15 - Lab 3 IIR Filter as Resonator  
Lecture 16 - Lab 4 Use of FDA tool box to generate co-efficients  
Lecture 17 - Lab: Real-Time Audio Output through Sine Generation  
Lecture 18 - IIR Filters 4  
Lecture 19 - Lab: FIR Filter in generation of music  
Lecture 20 - Lab: Real-Time Audio Output through FIR Filter  
Lecture 21 - DFT, DTFT, twiddle factors, properties, circular convolution and examples  
Lecture 22 - Complexity of Filtering and the FFT  
Lecture 23 - Lab: Filtering Using FFT  
Lecture 24 - Lab: FFT in CCS  
Lecture 25 - FFT - 1  
Lecture 26 - FFT - 2  
Lecture 27 - FFT - 3  
Lecture 28 - Overlap - Add  
Lecture 29 - Overlap Save Method

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

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- Lecture 30 - Lab: Overlap Add and Save Method using MATLAB
- Lecture 31 - Correlation
- Lecture 32 - Lab: Different ways of implementing FFT in CCS
- Lecture 33 - Adaptive Filter
- Lecture 34 - Lab: LMS Algorithm in MATLAB
- Lecture 35 - LMS Algorithm
- Lecture 36 - Lab: Error surface and error contour
- Lecture 37 - Adaptive Filter Applications
- Lecture 38 - Lab: Application of adaptive filter in MATLAB
- Lecture 39 - Adaptive Echo Cancellation
- Lecture 40 - Lab: Application of adaptive filter in CCS, Echo, scrambling and graphic equalizer in MATLAB
- Lecture 41 - Graphic Equalizer
- Lecture 42 - Lab: Adaptive filters (MATLAB)
- Lecture 43 - Speech Coding - I
- Lecture 44 - Speech Coding - II
- Lecture 45 - Speech Coding - III
- Lecture 46 - Lab: LPC for speech synthesis
- Lecture 47 - Discrete Cosine Transform - 1
- Lecture 48 - Discrete Cosine Transform - 2
- Lecture 49 - Discrete Cosine Transform - 3
- Lecture 50 - Discrete Cosine Transform - 4
- Lecture 51 - Lab: Adaptive filters (CCS) - 1
- Lecture 52 - Lab: Adaptive filters (CCS) - 2
- Lecture 53 - Lab: Discrete Cosine Transformation
- Lecture 54 - Lab: Echogeneration
- Lecture 55 - Lab: Using JiDSP
- Lecture 56 - Summary

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

NPTEL Video Course - Electrical Engineering - NOC:Advanced Neural Science for Engineers

Subject Co-ordinator - Prof. Vikas V

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction to Biomedical Research  
Lecture 2 - Fabricated Biosensors and Systems  
Lecture 3 - Lab 1 - Introduction to the Fabrication lab  
Lecture 4 - Lab 2 - Cleanroom and Gowning Protocol  
Lecture 5 - Developed Systems at a glance  
Lecture 6 - Silicon and Silicon Dioxide  
Lecture 7 - Piranha Cleaning of Silicon Wafer  
Lecture 8 - Polyimide Coating on Silicon Wafer  
Lecture 9 - Thermal Oxidation of Silicon and Thickness measurement  
Lecture 10 - Fundamental of Physical Vapour Deposition  
Lecture 11 - Lab 3 - Lithography: Demonstration  
Lecture 12 - Sputtering  
Lecture 13 - Basics of Photolithography  
Lecture 14 - Lab 4 - E-Beam Evaporation: Demo  
Lecture 15 - Photolithography - II  
Lecture 16 - Photolithography - III  
Lecture 17 - Lab 5 - E-Beam Evaporation: Demo - II  
Lecture 18 - Lab 6 - Liftoff Demonstration  
Lecture 19 - Lithography Optics - I  
Lecture 20 - Soft Lithography - I  
Lecture 21 - Soft Lithography - II  
Lecture 22 - Lab 7 - Sputtering Demonstration - I  
Lecture 23 - Lab 8 - Sputtering Demonstration - II  
Lecture 24 - Thin Film Deposition: CVD - I  
Lecture 25 - Thin Film Deposition: CVD - II  
Lecture 26 - Lithography Optics - II  
Lecture 27 - Role of Fabrication in Neural Engineering  
Lecture 28 - Micromachining  
Lecture 29 - Overview of Experimental Neurophysiology

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

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- Lecture 30 - Fabrication of Neural Implants
- Lecture 31 - Introduction to Packaging for Neural Systems
- Lecture 32 - Lab 9 - 3D Printing for neural devices
- Lecture 33 - Introduction to Biopotentials
- Lecture 34 - EEG: Introduction, Demonstration and Applications
- Lecture 35 - Neural Implants: Fabrication and Characterization
- Lecture 36 - Design of Wireless Biphasic Pulse Generator
- Lecture 37 - Basics of EEG/ERP Experimental Design
- Lecture 38 - Micromachining and Etching
- Lecture 39 - Epileptic Seizure Detection and Classification
- Lecture 40 - Newborn Hearing Screening - I
- Lecture 41 - Newborn Hearing Screening - II
- Lecture 42 - Applications of EEG/ERP Experimental Design
- Lecture 43 - Flexible MEA for Electrocorticography Signal Acquisition
- Lecture 44 - Flexible biodegradable MEAs
- Lecture 45 - Microneedle Electrode Array
- Lecture 46 - Neurosurgery-based MEA Implantation - I
- Lecture 47 - Neurosurgery-based MEA Implantation - II
- Lecture 48 - Neurosurgery-based MEA Implantation - III
- Lecture 49 - Neurosurgery-based MEA Implantation - IV
- Lecture 50 - Deep Brain Stimulation/Recording for Parkinson's - I
- Lecture 51 - Deep Brain Stimulation/Recording for Parkinson's - II
- Lecture 52 - Computational Neuroscience Fundamentals
- Lecture 53 - Mathematical Analysis in Neural Science
- Lecture 54 - Neuroanatomy for Neural Engineering

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

NPTEL Video Course - Electrical Engineering - NOC:Design of Electric Motors

Subject Co-ordinator - Dr. Prathap Reddy

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - History Prospect of Electrical Machines
- Lecture 2 - Electric Fields
- Lecture 3 - Magnetic Fields - 1
- Lecture 4 - Magnetic Fields - 2
- Lecture 5 - Electric and Magnetic Circuits Interface
- Lecture 6 - Magnetic Materials and Concepts of BH Curves
- Lecture 7 - Analysis of Magnetic Circuits With and Without Air Gaps
- Lecture 8 - Example Problems of Magnetic Circuits
- Lecture 9 - Magnetic Circuits with Multiple Windings and Permanent Magnets
- Lecture 10 - Force Equations in Electromechanical Systems - 1
- Lecture 11 - Force Equations in Electromechanical Systems - 2
- Lecture 12 - Design of Electromagnetic Systems
- Lecture 13 - Realization of Electrical Machines - 1
- Lecture 14 - Realization of Electrical Machines - 2
- Lecture 15 - Magnetic Fields in DC Machines - 1
- Lecture 16 - Magnetic Fields in AC Machines - 1
- Lecture 17 - Magnetic Fields in AC Machines - 2
- Lecture 18 - Magnetic Fields in AC Machines - 3
- Lecture 19 - MMFDistribution ofAC Machines
- Lecture 20 - Basics of Electrical Machine Windings
- Lecture 21 - Stator winding design-single layer winding
- Lecture 22 - Stator winding design-double layer winding
- Lecture 23 - Stator Winding Design-Fractional Slot Double Layer Winding
- Lecture 24 - Variable Pole Machine Stator Winding Design (Pole-Phase Modulation) - 1
- Lecture 25 - Variable Pole Machine Stator Winding Design (Pole-Phase Modulation) - 2
- Lecture 26 - Importance of Motor Design and Standards of Electric Motors
- Lecture 27 - Electric Machine Sizing Equations-Output Power and Volume (D2L) Product Equation
- Lecture 28 - Lab Session on Re-winding of Induction Motor (Example: Double Layer Winding)
- Lecture 29 - The Figure of Merits for Electric Motors and Aspect Ratio to Decouple the D2L Product

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

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- Lecture 30 - Electric Machine Sizing Equations-Output Power Equation in terms of D3L Product - 1
- Lecture 31 - Electric Machine Sizing Equations-Output Power Equation in terms of D3L Product - 2
- Lecture 32 - Analysis of Copper Function and Output Function w r t the Electric Machine D3L Product Eqn
- Lecture 33 - Example Problems on Output Power Equation in terms of D3L Product
- Lecture 34 - Electric Machine Sizing Equations-Output Power Equation in terms of D the power 2.5 L Product
- Lecture 35 - Design Procedure of an Electric Machine
- Lecture 36 - Name Plate Details and Datasheets of Induction Motor
- Lecture 37 - Design of Induction Machine- Stator Design - 1 (Stator Core design)
- Lecture 38 - Design of Induction Machine- Stator Design - 2 (Stator Winding Design)
- Lecture 39 - Design of Induction Machine- Stator Design - 3 (Stator Slot Geometry)
- Lecture 40 - Design of Induction Machine- Rotor Design - 1 (Rotor Slots Selection)
- Lecture 41 - Design of Induction Machine- Rotor Design - 2 (Rotor MMF and Bar Currents)
- Lecture 42 - Design of Induction Machine- Rotor Design - 3 (Rotor Slot Geometry)
- Lecture 43 - Design of Induction Machine- Rotor Design - 4 (Skewing of Rotor)
- Lecture 44 - Design of Induction Machine- Rotor Design - 4 (Resistance of Rotor Winding)
- Lecture 45 - Carter's Coefficient of Electrical Machines
- Lecture 46 - Effective Length Equations of the Machine Core with Different Stator and Rotor Lengths
- Lecture 47 - Stator MMF and Magnetizing Current Equations of Induction Machine
- Lecture 48 - Magnetizing Inductance of Induction Machine
- Lecture 49 - Stator and Rotor Leakage Inductances of Induction Machine
- Lecture 50 - Equivalent Circuit Parameters of Induction Machine
- Lecture 51 - Loss Calculation of Induction Machine - 1
- Lecture 52 - Loss Calculation of Induction Machine - 2 and Performance Parameters of Induction Motor
- Lecture 53 - Switched Reluctance Machine Sizing Equations-Output Power and Volume (D2L) Product Equation
- Lecture 54 - The Figure of Merits for SRM and Example Problem on Output Power Equation i t f D2L Product
- Lecture 55 - Design of Switched Reluctance Machine: Stator Design - 1
- Lecture 56 - Design of Switched Reluctance Machine: Stator Design - 2 and Rotor Design
- Lecture 57 - Procedure for Calculation of SRM Inductance: Aligned Inductance - 1
- Lecture 58 - Calculation of SRM Inductance: Aligned Inductance - 2
- Lecture 59 - Efficiency and Loss Calculation of SRM
- Lecture 60 - Importance of Thermal Design and Thermal Limits for Electrical Machines
- Lecture 61 - Electric and Thermal Circuits Interface
- Lecture 62 - Heat Transfer Methods and Basic Equations for Thermal Resistance
- Lecture 63 - Heat Flow in Electrical Machines
- Lecture 64 - Cooling Methods and Standards for Electrical Machines
- Lecture 65 - Basics of Thermal Equivalent Circuits
- Lecture 66 - Thermal Equivalent Circuit - 1
- Lecture 67 - Thermal Equivalent Circuit - 2

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

NPTEL Video Course - Electrical Engineering - NOC:Basics of Semiconductor Microwave Devices

Subject Co-ordinator - Prof Digbijoy N Nath

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - An Introduction to the course and outline of the course
- Lecture 2 - Historical overview of the development of microwave devices
- Lecture 3 - Applications of semiconductor microwave devices
- Lecture 4 - Applications of semiconductor microwave devices (Continued...)
- Lecture 5 - Heterojunction device physics
- Lecture 6 - Heterojunction device physics (Continued...) and III-nitrides
- Lecture 7 - III-nitrides and polarization
- Lecture 8 - III-nitride high electron mobility transistors
- Lecture 9 - Varactors and Schottky multipliers
- Lecture 10 - Varactors and Schottky multipliers (Continued...)
- Lecture 11 - Diodes for microwave applications
- Lecture 12 - IMPATT diode
- Lecture 13 - Tunnel diodes and Introduction to Gunn diodes
- Lecture 14 - Gunn diode and its modes
- Lecture 15 - Introduction to MESFETs
- Lecture 16 - Advanced concepts of GaAs MESFETs
- Lecture 17 - GaAs MESFET fabrication and practical aspects
- Lecture 18 - Practical aspects of FET design and small-signal model
- Lecture 19 - GaAs MESFETs: cut-off frequency and aspects of power devices
- Lecture 20 - GaAs MESFETs for power amplifiers
- Lecture 21 - Modulation doping in compound semiconductors
- Lecture 22 - Band diagram of MODFETs/HEMTs
- Lecture 23 - Design issues and methodology for microwave HEMTs
- Lecture 24 - Small-signal model and noise in HEMTs
- Lecture 25 - The concept of pseudomorphic or pHEMTs
- Lecture 26 - Multi-finger HEMTs
- Lecture 27 - pHEMTs for low noise and introduction to InP HEMT
- Lecture 28 - InP HEMTs for power and the concept of metamorphic HEMTs
- Lecture 29 - AlGaIn/GaN HEMT: applications, structure, substrates and FOM

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

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- Lecture 30 - AlGa<sub>N</sub>/Ga<sub>N</sub> HEMT: device basics, current collapse and passivation
- Lecture 31 - AlGa<sub>N</sub>/Ga<sub>N</sub> HEMT: gate process, field-plate and trade-offs in design
- Lecture 32 - AlGa<sub>N</sub>/Ga<sub>N</sub> HEMT: Practical aspects and commercial HEMTs
- Lecture 33 - Ga<sub>N</sub> RF HEMT on eval board, and emerging topics of research
- Lecture 34 - Linearity in Ga<sub>N</sub> HEMTs - A device perspective
- Lecture 35 - Nanoscale MOSFETs and short channel effects
- Lecture 36 - Parasitic resistances and capacitances in nanoscale MOSFETs
- Lecture 37 - RF MOSFET Layout and RF Silicon-on-insulator
- Lecture 38 - Noise in MOSFETs and Introduction to LDMOS
- Lecture 39 - Working of LDMOS and VDMOS
- Lecture 40 - LDMOS: Parasitics, and the concept of RESURF
- Lecture 41 - LDMOS: HCI, snapback, finger layout and some aspects of commercial devices
- Lecture 42 - BJT: common base and common emitter from the device point of view
- Lecture 43 - BJT: Kirk effect, Ebers-Moll model and base transit time
- Lecture 44 - BJT: small-signal model, gain and cut-off frequency
- Lecture 45 - BJT: Emitter and base designs and drift transistor
- Lecture 46 - Collector design in modern BJT and Introduction to HBTs
- Lecture 47 - HBT: base current and collapse of the current gain
- Lecture 48 - High-frequency HBT and Introduction to SiGe HBT
- Lecture 49 - SiGe HBT: various resistances and capacitances, scaling and aspects of BiCMOS
- Lecture 50 - Basics of microwave: transmission line theory
- Lecture 51 - Waveguides, T-lines and introduction to 2-port networks
- Lecture 52 - S-parameters and the basics of Smith Chart
- Lecture 53 - Smith chart and matching
- Lecture 54 - Impedance matching using Smith Chart and stub line
- Lecture 55 - Passives in microwave circuits
- Lecture 56 - Inductors in microwave circuits
- Lecture 57 - More on passive elements in microwave circuits
- Lecture 58 - On-wafer measurement and S-parameters
- Lecture 59 - On-wafer de-embedding
- Lecture 60 - On-wafer and fixture-based measurements and calibration
- Lecture 61 - More on fixtures and basic transistor concepts for power amplifiers