

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

NPTEL Video Course - Aerospace Engineering - Introduction to Aerospace Propulsion

Subject Co-ordinator - Prof. Bhaskar Roy, Prof. A M Pradeep

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Course Intro & Historical development of flights

Lecture 2 - Early development of aircraft propulsive devices

Lecture 3 - Development of Jet propulsion for aircraft

Lecture 4 - Introduction to thermodynamics, Scope and method, Basic concepts

Lecture 5 - Quasi-static processes, zeroth law of thermodynamics and temperature, concept of energy and its v

Lecture 6 - Specific heats at constant pressure and volume Work and heat transfers

Lecture 7 - Tutorial

Lecture 8 - First law of thermodynamics for closed systems

Lecture 9 - First law of thermodynamics for open systems/flow processes

Lecture 10 - Second law of thermodynamics, heat engines, refrigerators and heat pumps, Kelvin-Planck and Clau

Lecture 11 - Reversible and irreversible processes, concept of entropy

Lecture 12 - Increase of entropy principle, third law of thermodynamics, absolute entropy, perpetual motion m

Lecture 13 - Tutorial

Lecture 14 - Carnot cycle, Carnot principle, thermodynamic temperature scale

Lecture 15 - Exergy, availability and second law efficiency

Lecture 16 - Tutorial

Lecture 17 - Gas and vapour power cycles, Otto cycle, Diesel cycle, Dual cycle

Lecture 18 - Rankine cycle, Brayton cycle, Stirling and Ericsson cycles

Lecture 19 - Thermodynamic property relations, Jacobean and Legendre transformations, Maxwell's equations

Lecture 20 - Tutorial

Lecture 21 - Properties of gas and vapour mixtures

Lecture 22(A) - One-dimensional compressible flows, isentropic flows

Lecture 22(B) - Flows with friction and heat transfer, normal and oblique shocks

Lecture 23 - Piston-prop engines

Lecture 24 - IC Engines for aircraft application

Lecture 25 - Performance parameters of IC engines

Lecture 26 - Supercharging of aircraft IC engines

Lecture 27 - Tutorial

Lecture 28 - Propeller fundamentals

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- Lecture 29 - Propeller aerodynamic theories - I
- Lecture 30 - Propeller aerodynamic theories - II
- Lecture 31 - Tutorial
- Lecture 32 - Ideal cycles for Jet engines
- Lecture 33 - Ideal cycles for variants of jet engines
- Lecture 34 - Tutorial
- Lecture 35 - Fundamentals of Ramjets and Pulsejets
- Lecture 36 - Fundamentals of Rocket engines
- Lecture 37 - Fundamentals of Missile engines
- Lecture 38 - Various space vehicles and their engines
- Lecture 39 - Closure of the lecture series

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

NPTEL Video Course - Aerospace Engineering - Jet Aircraft Propulsion

Subject Co-ordinator - Prof. A M Pradeep, Prof. Bhaskar Roy

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction & Development of Jet Aircraft Propulsion
- Lecture 2 - How the Aircraft Jet Engines make Thrust
- Lecture 3 - Jet Engine Basic Performance Parameters
- Lecture 4 - Turbojet, Reheat Turbojet and Multi-spool Engines
- Lecture 5 - Turbofan, Turbo-prop and Turboshift engines
- Lecture 6 - Ideal and Real Brayton cycles
- Lecture 7 - Jet Engine Cycles for Aircraft propulsion
- Lecture 8 - Cycle components and component performances
- Lecture 9 - Tute-1
- Lecture 10 - Analysis of engine real cycles
- Lecture 11 - Tute-2
- Lecture 12 - Thermodynamics of Compressors
- Lecture 13 - Thermodynamics of Turbines
- Lecture 14 - Axial Compressors
- Lecture 15 - Cascade analysis; Loss and Blade performance estimation
- Lecture 16 - Free Vortex theory; Single-Multi-stage characteristics
- Lecture 17 - Tutes-3
- Lecture 18 - Elements of centrifugal compressor
- Lecture 19 - Centrifugal Compressor characteristics
- Lecture 20 - Axial flow turbines; Turbine Blade 2-D (cascade) analysis
- Lecture 21 - Multi-staging
- Lecture 22 - Radial Turbine Aerodynamics & Thermodynamics; Losses
- Lecture 23 - Tutes-4
- Lecture 24 - Types of combustion chambers
- Lecture 25 - Pr. Loss, Combustion efficiency; Combustion intensity
- Lecture 26 - Practical combustion system ; Stability, Fuel injection
- Lecture 27 - Intakes for Powerplant
- Lecture 28 - Subsonic, Transonic, Supersonic Intake Designs
- Lecture 29 - Nozzle

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- Lecture 30 - C-D nozzle and their uses
- Lecture 31 - Tute-5
- Lecture 32 - Engine Off Design Operations
- Lecture 33 - Aircraft Engine component matching
- Lecture 34 - Engine component matching and Sizing
- Lecture 35 - Installed Performance of Engine
- Lecture 36 - Tute-6
- Lecture 37 - Use of Ramjets and Pulsejets in Aircraft propulsion
- Lecture 38 - Thermodynamic Cycle & Performance Parameters
- Lecture 39 - Flow in Diffusers, Combustors and Nozzles
- Lecture 40 - Performance and Design of Ramjet & Scramjet Engines
- Lecture 41 - Tute-7
- Lecture 42 - Future of Aircraft Propulsion

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

NPTEL Video Course - Aerospace Engineering - Turbomachinery Aerodynamics

Subject Co-ordinator - Prof. Bhaskar Roy, Prof. A M Pradeep

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction to Turbo machines Syllabus, References and Schedules

Lecture 2 - Axial Flow Compressors and Fans

Lecture 3 - A two dimensional analytical model

Lecture 4 - 2D losses in Axial flow Compressor Stage

Lecture 5 - Tutorial 1

Lecture 6 - 3D Flows in Blade Passages, Secondary Flows, Tip leakage Flow, Scrubbling

Lecture 7 - Three Dimensional Flow Analysis

Lecture 8 - Classical Blade Design Laws

Lecture 9 - Three Dimensional Flow Analysis in Axial Flow Compressor

Lecture 10 - Tutorial 2

Lecture 11 - Axial Compressor Characteristics

Lecture 12 - Instability in Axial Compressors

Lecture 13 - Inlet Distortion and Rotating Stall, Control of Instability

Lecture 14 - Transonic Compressors and Shock Structure Models, Transonic Compressor Characteristics

Lecture 15 - Axial Flow Compressor Design, Inter Spool Duct

Lecture 16 - Design of Compressor Blades, Aerofoil Design (Subsonic, Transonic, Supersonic Profiles )

Lecture 17 - Design of Compressor Blade

Lecture 18 - Noise Problem in Axial Compressors and Fans

Lecture 19 - Axial Flow Turbines

Lecture 20 - Axial Flow Turbines

Lecture 21 - Axial Flow Turbines

Lecture 22 - Axial Flow Turbines

Lecture 23 - Tutorial 3

Lecture 24 - Multi staging and Multi spooling of Turbine

Lecture 25 - 3D Flow in Turbine

Lecture 26 - Tutorial 4

Lecture 27 - Turbine Blade Cooling â Fundamentals of Heat Transfer, Blade Cooling Requirements

Lecture 28 - Turbine Blade Cooling Technologies

Lecture 29 - Turbine Blade Design

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- Lecture 30 - Turbine Blade Design
- Lecture 31 - Centrifugal Compressors
- Lecture 32 - Centrifugal Compressors
- Lecture 33 - Tutorial 5
- Lecture 34 - Design of Centrifugal Compressors
- Lecture 35 - Radial Turbines
- Lecture 36 - Tutorial 6
- Lecture 37 - Radial Turbine Characteristics and Design of Radial Turbines
- Lecture 38 - CFD for Turbomachinery
- Lecture 39 - CFD for Turbomachinery
- Lecture 40 - CFD for Turbomachinery

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

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

Subject Co-ordinator - Prof. Rajkumar Pant

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Course Layout and Brief Introduction of Course Instructor
- Lecture 2 - Introduction to International Standard Atmosphere (ISA)
- Lecture 3 - Pressure, Temperature, Density and Viscosity Variation with Altitude in ISA
- Lecture 4 - Other Standard Atmospheres
- Lecture 5 - Aircraft Component Nomenclature - Wing and its Components
- Lecture 6 - Aircraft Component Nomenclature - Fuselage and its Components
- Lecture 7 - Aircraft Component Nomenclature - Tail Plane and its Components
- Lecture 8 - Tutorial 1 - Aircraft Component Nomenclature
- Lecture 9 - Essentials of Incompressible Flow - Part I
- Lecture 10 - Essentials of Incompressible Flow - Part II
- Lecture 11 - Bernoulli's Equation and Coanda Effect
- Lecture 12 - Mach Number
- Lecture 13 - Tutorial 2 - Incompressible Flow and Flow Visualization
- Lecture 14 - Viscous Flow and Reynolds Number
- Lecture 15 - Introduction to Boundary Layer
- Lecture 16 - Pressure Measurement
- Lecture 17 - Air Speed Measurement - Pitot Static Tube
- Lecture 18 - Air Speed Corrections
- Lecture 19 - Altitude and ROC/ROD Measurement
- Lecture 20 - Measurements in Compressible Flows
- Lecture 21 - Non Pneumatic Instruments
- Lecture 22 - Introduction to Aerofoils and Aerofoil Nomenclature
- Lecture 23 - Aerofoils - A Visit to the Past
- Lecture 24 - Thick Aerofoils
- Lecture 25 - Low Reynolds Number Aerofoils
- Lecture 26 - Lift Generation by Wings - Part I
- Lecture 27 - Lift Generation by Wings - Part II
- Lecture 28 - Coefficient of Lift and Coefficient of Pressure
- Lecture 29 - Tutorial on Aerofoils

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- Lecture 30 - Critical Mach Number
- Lecture 31 - Wave Drag
- Lecture 32 - Swept Wings
- Lecture 33 - Introduction to Drag and Types of Drag
- Lecture 34 - Factors Affecting Induced Drag
- Lecture 35 - Skin Friction Drag
- Lecture 36 - Tutorial on Critical Mach Number and Wave Drag
- Lecture 37 - Introduction to Propulsion
- Lecture 38 - Gas Turbine Engine Types - Part I
- Lecture 39 - Gas Turbine Engine Types - Part II
- Lecture 40 - Introduction to Electric Propulsion and Ion Propulsion
- Lecture 41 - Steady Level Flight
- Lecture 42 - Power Required for the Steady Level Flight
- Lecture 43 - Steady Level Flight - A Pilot's View
- Lecture 44 - Tutorial on Steady Level Flight
- Lecture 45 - Gliding Flight
- Lecture 46 - Climbing Flight and Ceiling
- Lecture 47 - Introduction to Turning Flight
- Lecture 48 - Turning Flight Equations
- Lecture 49 - Instantaneous and Sustained Turn
- Lecture 50 - Tutorial on Climbing Flight and Turning Flight
- Lecture 51 - Introduction to Static Stability
- Lecture 52 - Aerodynamic Center and Effect of Center of Gravity
- Lecture 53 - Effect of Center of Gravity - A Practical Demonstration
- Lecture 54 - Introduction to V-n Diagram
- Lecture 55 - V-n Diagram as per FAR 23 Regulations
- Lecture 56 - Effect of Gusts on V-n Diagram
- Lecture 57 - Tutorial on Stability and Control
- Lecture 58 - Range
- Lecture 59 - Specific Fuel Consumption and Generalized Range Equation
- Lecture 60 - Endurance
- Lecture 61 - Take-off Performance of Flight - Part I
- Lecture 62 - Take-off Performance of Flight - Part II
- Lecture 63 - Landing Performance of Flight
- Lecture 64 - Tutorial on Range Payload Diagram
- Lecture 65 - Tutorial on Range and Endurance
- Lecture 66 - Flapping Wing Aerodynamics - Part I
- Lecture 67 - Flapping Wing Aerodynamics - Part II

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Aircraft Design

Subject Co-ordinator - Prof. Rajkumar Pant

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - What is Aircraft Design
- Lecture 2 - Aircraft Design Process
- Lecture 3 - Design Stages
- Lecture 4 - Phases in Aircraft Design
- Lecture 5 - The Design Spiral
- Lecture 6 - Importance of Cost in Aircraft Design
- Lecture 7 - Basic Laws of Aircraft Design
- Lecture 8 - Requirements Capture
- Lecture 9 - Quality Function Deployment
- Lecture 10 - House of Quality Chart
- Lecture 11 - Example of HoQ for HALE UAV
- Lecture 12 - Illustration of HOQ-GA aircraft
- Lecture 13 - Airliners
- Lecture 14 - Key Issues in Design of Airliners
- Lecture 15 - Design Considerations - Future Airliners
- Lecture 16 - Supersonic Transport Aircraft
- Lecture 17 - Airliner and Supersonic Aircraft, some additional concepts
- Lecture 18 - Design Considerations - Cargo Aircraft
- Lecture 19 - Design Considerations - GA Aircraft
- Lecture 20 - Types of Military Aircraft
- Lecture 21 - Cargo, GA and Military Aircraft, Some additional concepts
- Lecture 22 - Aircraft Configuration Design
- Lecture 23 - Podded Engines on Wings
- Lecture 24 - Wing Sweep
- Lecture 25 - Canards and Flying Wing
- Lecture 26 - Three Surface Aircraft
- Lecture 27 - Winglets
- Lecture 28 - Thrust Vectoring
- Lecture 29 - Few Novel Concepts\_01

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- Lecture 30 - Aircraft Configuration Design - Closing Remarks
- Lecture 31 - Choices in Aircraft Layout
- Lecture 32 - Wing Geometry Definitions
- Lecture 33 - Options for Wing layout
- Lecture 34 - Propulsion System Layout
- Lecture 35 - Tail Plane Layout
- Lecture 36 - Landing Gear Layout - Part 1
- Lecture 37 - Landing Gear Layout - Part 2
- Lecture 38 - Landing Gear of some Famous Aircraft
- Lecture 39 - Tutorial on OpenVSP
- Lecture 40 - Initial Sizing in Aircraft Design
- Lecture 41 - Estimation of Empty Weight Fraction
- Lecture 42 - Estimation of Mission Segment Weights
- Lecture 43 - Estimation of Fuel Weight Fractions
- Lecture 44 - Estimation of maximum L/D
- Lecture 45 - Estimation of engine parameters
- Lecture 46 - Estimation of Design gross weight
- Lecture 47 - Take-off weight build up
- Lecture 48 - Tutorial on Initial Sizing of Transport Aircraft
- Lecture 49 - Tutorial on Initial Sizing of Military Aircraft
- Lecture 50 - Subsonic Parasite Drag Estimation
- Lecture 51 - Component Buildup Method
- Lecture 52 - Drag Estimation of Military Aircraft
- Lecture 53 - Tutorial on Drag Polar Estimation of Military Aircraft
- Lecture 54 - Estimation of Lift Coefficient
- Lecture 55 - Estimation of Maximum Lift Coefficient
- Lecture 56 - Flaps as High Lift Devices
- Lecture 57 - Tutorial on Lift Coefficient Estimation of Transport Aircraft
- Lecture 58 - Tutorial on Lift Coefficient Estimation of Military Aircraft
- Lecture 59 - Constraint Analysis- Introductory Remarks
- Lecture 60 - Constraint Analysis- Transport Aircraft - Part 1
- Lecture 61 - Constraint Analysis- Transport Aircraft - Part 2
- Lecture 62 - Tutorial on Constraint Analysis of Transport Aircraft - Part 1
- Lecture 63 - Tutorial on Constraint Analysis of Transport Aircraft - Part 2
- Lecture 64 - Constraint Analysis- Military Aircraft
- Lecture 65 - Tutorial on Constraint Analysis of Military Aircraft - Part 1
- Lecture 66 - Tutorial on Constraint Analysis of Military Aircraft - Part 2
- Lecture 67 - Refined Sizing
- Lecture 68 - Tutorial on Refined Sizing of Jet Fighter Aircraft

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- Lecture 69 - Cost Estimation in Aircraft Conceptual Design
- Lecture 70 - Aircraft Life Cycle Cost Estimation
- Lecture 71 - Tutorial on RDT&E and Production Cost Estimation of Transport Aircraft
- Lecture 72 - Tutorial on DT&E and Production Cost Estimation of HALE UAV
- Lecture 73 - Estimation of Direct Operating Cost
- Lecture 74 - Fighter Aircraft Life Cycle Cost Estimation Model
- Lecture 75 - Range Payload Diagram - Part 1
- Lecture 76 - Range Payload Diagram - Part 2
- Lecture 77 - Tutorial on Range Payload Diagram of Transport Aircraft
- Lecture 78 - Environmental issues in Aircraft Design
- Lecture 79 - Limit Manoeuvre Envelope
- Lecture 80 - Effect of Gust
- Lecture 81 - Aircraft Loads
- Lecture 82 - Tutorial on V-n Diagram of Transport Aircraft
- Lecture 83 - High Altitude Long Endurance (HALE) Aircraft
- Lecture 84 - Morphing of Aircraft Configurations
- Lecture 85 - Guest Lecture on Air Power and Multi-role Fighter Aircraft - Part 1
- Lecture 86 - Guest Lecture on Air Power and Multi-role Fighter Aircraft - Part 2

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Launch Vehicle Analysis and Design

Subject Co-ordinator - Prof. Ashok Joshi

Co-ordinating Institute - IIT - Bombay

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

Lecture 1 - Introduction  
Lecture 2 - Course Plan  
Lecture 3 - Ascent Mission Basics  
Lecture 4 - Force and Geometry Models - 1  
Lecture 5 - Force and Geometry Models - 2  
Lecture 6 - Idealized Performance  
Lecture 7 - Trajectory Under Gravity  
Lecture 8 - Impact of Gravity  
Lecture 9 - Impact of Drag  
Lecture 10 - Curvilinear Motion Concept  
Lecture 11 - Constant Pitch Rate Solution  
Lecture 12 - Constant Velocity Solution  
Lecture 13 - Constant (T/m) Solution  
Lecture 14 - Ascent Mission Design  
Lecture 15 - Multi-stage Rocket Basics  
Lecture 16 - Multi-stage Configuration Basics  
Lecture 17 - Multi-stage Solution Basics  
Lecture 18 - Multi-stage Problem Definition  
Lecture 19 - Optimal Staging Strategy  
Lecture 20 - Lagrange Solution  
Lecture 21 - Approximate Staging Solution  
Lecture 22 - Variant Concept  
Lecture 23 - Variant Design Solution  
Lecture 24 - Parallel Staging Concept  
Lecture 25 - Parallel Staging Benefits  
Lecture 26 - Jet Damping and Ballistic Missiles  
Lecture 27 - Current Rocket Concepts  
Lecture 28 - Launch Widow and SSTO Concepts  
Lecture 29 - Reentry Concept

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- Lecture 30 - Ballistic Reentry Solution
- Lecture 31 - Lifting and Other Reentry Modes
- Lecture 32 - Concluding Remarks
- Lecture 33 - Rectilinear Trajectories
- Lecture 34 - Curvilinear Trajectories
- Lecture 35 - Multi-stage Rocket Concept
- Lecture 36 - Optimal Multi-stage Solutions

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

NPTEL Video Course - Aerospace Engineering - NOC:Lighter than Air Systems

Subject Co-ordinator - Prof. Rajkumar Pant

Co-ordinating Institute - IIT - Bombay

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

- Lecture 1 - Introduction to the Course Content
- Lecture 2 - Differences between LTA and HTA systems
- Lecture 3 - The three conventional LTA systems
- Lecture 4 - LTA gases, Types of Airships and their components
- Lecture 5 - Introduction of Skyship 600 and USP of Airships
- Lecture 6 - Applications of Airships
- Lecture 7 - Tethered Aerostat systems
- Lecture 8 - Why use Aerostats ?
- Lecture 9 - Some Queries on Aerostats
- Lecture 10 - Historical developments of LTA systems - Part I
- Lecture 11 - Historical developments of LTA systems - Part II
- Lecture 12 - Historical developments of LTA systems - Part III
- Lecture 13 - Historical developments of LTA systems - Part IV
- Lecture 14 - Historical developments of LTA systems - Part V
- Lecture 15 - Historical developments of LTA systems - Part VI
- Lecture 16 - Overview of PADD
- Lecture 17 - Remotely Controlled Airships
- Lecture 18 - Autonomous Airships
- Lecture 19 - Indoor Blimp Projects by students
- Lecture 20 - Biomimetic Airships
- Lecture 21 - Introduction to Buoyancy
- Lecture 22 - Basic Concepts of Aerostatics
- Lecture 23 - Ballasting, Weigh-off and Fuel Weight Recovery
- Lecture 24 - In-flight Ballast Collection methods
- Lecture 25 - Static Lift Prediction - Part I
- Lecture 26 - Static Lift Prediction - Part II
- Lecture 27 - Tutorial Problem 01 on Static Lift Estimation
- Lecture 28 - Effect of Humidity and Vapour Pressure
- Lecture 29 - Calculation of Ambient Air Density

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- Lecture 30 - Tutorial Problem 02 and 03 on Static Lift Estimation
- Lecture 31 - Effect of Lifting Gas Purity, Superpressure and Superheat
- Lecture 32 - Ballonet Air Weight Estimation
- Lecture 33 - Net Static Lift of non-rigid airships
- Lecture 34 - Net Static Lift for other LTA Systems
- Lecture 35 - Tutorial Problem 04 on Net Static Lift Estimation
- Lecture 36 - Parameters affecting Static Lift
- Lecture 37 - Effect of change in Atmospheric Pressure
- Lecture 38 - Tutorial Problem 05 on Change in Atmospheric Pressure
- Lecture 39 - Effect of Superpressure
- Lecture 40 - Tutorial Problem 06 on effect of Superpressure
- Lecture 41 - Effect of Slow change in Atmospheric Temperature and Superheat
- Lecture 42 - Effect of Rapid change in Atmospheric Temperature
- Lecture 43 - Tutorial Problem 07 on Change in Atmospheric Temperature and Superheat
- Lecture 44 - Revision and Tutorial Problem 08 and 09 on Affecting Parameters of Static Lift
- Lecture 45 - Effect of change in Relative Humidity
- Lecture 46 - Effect of change in Lifting Gas Purity
- Lecture 47 - Effect of change in Lifting Gas Volume
- Lecture 48 - Determination of Inflation Fraction
- Lecture 49 - Flight To Lower Ground Elevation
- Lecture 50 - Tutorial Problem 10 on Helium Addition
- Lecture 51 - Outdoor Hot Air Balloon
- Lecture 52 - Pressure Height
- Lecture 53 - Tutorial Problem 11 on Pressure Height Calculation
- Lecture 54 - Sea Level Inflation Fraction
- Lecture 55 - Flight above Pressure Height
- Lecture 56 - Effect of Change in Operating Altitude
- Lecture 57 - Tutorial Problem 12 on Lifting Gas Loss
- Lecture 58 - Descent Following Exceedance
- Lecture 59 - Pressure Height for other LTA Vehicles
- Lecture 60 - Discussion of Practice Questions
- Lecture 61 - Envelope Materials - Part I
- Lecture 62 - Envelope Materials - Part II
- Lecture 63 - Envelope Materials - Part III
- Lecture 64 - Fabric Testing Machines - Part I
- Lecture 65 - Fabric Testing Machines - Part II
- Lecture 66 - Need for Ground Handling
- Lecture 67 - Aerium Hanger for CL 160 Airship
- Lecture 68 - Ground Handling of Airships

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- Lecture 69 - Types of Mooring Masts and Design Requirements
- Lecture 70 - Nose Battens for Envelopes
- Lecture 71 - Need for Airship Design Methodology
- Lecture 72 - Overview of Airship Design Methodology (ADM)
- Lecture 73 - Details of Airship Design Methodology (ADM)
- Lecture 74 - Inputs to Airship Design Methodology - Part 1
- Lecture 75 - Inputs to Airship Design Methodology - Part 2
- Lecture 76 - Design Constants in Airship Design Methodology
- Lecture 77 - Outputs from Airship Design Methodology
- Lecture 78 - Statistical Data Used in Airship Design Methodology
- Lecture 79 - Validation of Airship Design Methodology
- Lecture 80 - Envelope Shapes for LTA Systems
- Lecture 81 - Example of Application of Airship Design Methodology
- Lecture 82 - Conclusions and Limitations of Airship Design Methodology
- Lecture 83 - History of Propulsion Systems on Airships
- Lecture 84 - Steam and IC engines for Airships
- Lecture 85 - Electric motors for Airships
- Lecture 86 - Turboprops for Airships
- Lecture 87 - Solar Propulsion and Thrust Vectoring on Airships
- Lecture 88 - Transportation Problems Faced by Remote Regions
- Lecture 89 - Airships vs Helicopters - Part I
- Lecture 90 - Airships vs Helicopters - Part II
- Lecture 91 - Char Dham Yatra - Part I
- Lecture 92 - Char Dham Yatra - Part II
- Lecture 93 - Introduction to Aerostat Design Methodology
- Lecture 94 - Inputs for Aerostat Design Methodology
- Lecture 95 - Design Constants in Aerostat Design Methodology
- Lecture 96 - Overview of Aerostat Design Methodology
- Lecture 97 - Equilibrium Analysis of Aerostats - Part I
- Lecture 98 - Equilibrium Analysis of Aerostats - Part II
- Lecture 99 - Methodology for Tether Profile Estimation
- Lecture 100 - Introduction to High Altitude Airships
- Lecture 101 - Technological challenges in HALE Platforms development - Part I
- Lecture 102 - Technological challenges in HALE Platforms development - Part II
- Lecture 103 - Initial sizing of Stratospheric Airships
- Lecture 104 - Introduction to Hybrid Airships
- Lecture 105 - Lockheed Martin's P-791 Hybrid Airship
- Lecture 106 - Aeroscraft ML 866 Hybrid Airship
- Lecture 107 - SkyCat Hybrid Airship

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

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- Lecture 108 - Rotary and Winged Hybrid Airships
- Lecture 109 - Hybrid Ultra Heavy Lift Cargo Vehicle Transport
- Lecture 110 - Features of Hybrid Airships

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

NPTEL Video Course - Aerospace Engineering - Aero Elasticity

Subject Co-ordinator - Prof. C. Venkatesan

Co-ordinating Institute - IIT - Kanpur

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

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

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

NPTEL Video Course - Aerospace Engineering - Foundation of Scientific Computing

Subject Co-ordinator - Prof. Tapan K. Sengupta

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

Lecture 20

Lecture 21

Lecture 22

Lecture 23

Lecture 24 (Same as Lecture 23)

Lecture 25

Lecture 26

Lecture 27

Lecture 28

Lecture 29

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Lecture 30  
Lecture 31  
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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 - Aerospace Engineering - Instability and Transition of Fluid Flows

Subject Co-ordinator - Prof. Tapan K. Sengupta

Co-ordinating Institute - IIT - Kanpur

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

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

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

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- Lecture 30 - Instability and Transition of Fluid Flows
- Lecture 31 - Instability and Transition of Fluid Flows
- Lecture 32 - Instability and Transition of Fluid Flows
- Lecture 33 - Instability and Transition of Fluid Flows
- Lecture 34 - Instability and Transition of Fluid Flows
- Lecture 35 - Instability and Transition of Fluid Flows
- Lecture 36 - Instability and Transition of Fluid Flows
- Lecture 37 - Instability and Transition of Fluid Flows
- Lecture 38 - Instability and Transition of Fluid Flows
- Lecture 39 - Instability and Transition of Fluid Flows

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

NPTEL Video Course - Aerospace Engineering - Introduction to Helicopter Aerodynamics and Dynamics

Subject Co-ordinator - Prof. A.R. Manjunath, Prof. C. Venkatesan

Co-ordinating Institute - IIT - Kanpur | HAL

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

Lecture 1 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 2 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 3 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 4 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 5 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 6 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 7 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 8 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 9 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 10 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 11 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 12 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 13 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 14 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 15 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 16 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 17 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 18 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 19 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 20 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 21 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 22 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 23 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 24 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 25 - Introduction to Helicopter Aerodynamics and Dynamics  
Lecture 26 - Introduction to Helicopter Aerodynamics and Dynamics

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

NPTEL Video Course - Aerospace Engineering - Introduction to Propulsion

Subject Co-ordinator - Dr. D.P. Mishra

Co-ordinating Institute - IIT - Kanpur

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

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

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

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Lecture 30 - Fundamentals of Aerospace Propulsion  
Lecture 31 - Fundamentals of Aerospace Propulsion  
Lecture 32 - Fundamentals of Aerospace Propulsion  
Lecture 33 - Fundamentals of Aerospace Propulsion  
Lecture 34 - Fundamentals of Aerospace Propulsion  
Lecture 35 - Fundamentals of Aerospace Propulsion  
Lecture 36 - Fundamentals of Aerospace Propulsion  
Lecture 37 - Fundamentals of Aerospace Propulsion  
Lecture 38 - Fundamentals of Aerospace Propulsion  
Lecture 39 - Fundamentals of Aerospace Propulsion  
Lecture 40 - Fundamentals of Aerospace Propulsion

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

NPTEL Video Course - Aerospace Engineering - Jet and Rocket Propulsion

Subject Co-ordinator - Dr. A. Kushari

Co-ordinating Institute - IIT - Kanpur

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

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

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

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Lecture 30 - Jet and Rocket Propulsion  
Lecture 31 - Jet and Rocket Propulsion  
Lecture 32 - Jet and Rocket Propulsion  
Lecture 33 - Jet and Rocket Propulsion  
Lecture 34 - Jet and Rocket Propulsion  
Lecture 35 - Jet and Rocket Propulsion  
Lecture 36 - Jet and Rocket Propulsion  
Lecture 37 - Jet and Rocket Propulsion  
Lecture 38 - Jet and Rocket Propulsion  
Lecture 39 - Jet and Rocket Propulsion  
Lecture 40 - Jet and Rocket Propulsion

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Airplane Performance

Subject Co-ordinator - Dr. A.K. Ghosh, Dr. Deepu Philip

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - General Introduction
- Lecture 2 - George Cayley
- Lecture 3 - Introduction to airplane and its components
- Lecture 4 - Hansa 3 Aircraft and its Primary Systems
- Lecture 5 - Concept of Lift Aerofoil
- Lecture 6 - Drag Polar
- Lecture 7 - Revision
- Lecture 8 - Standard Atmosphere
- Lecture 9 - Measuring Instruments
- Lecture 10 - Equations of Motion
- Lecture 11 - Thrust Required, Power Required
- Lecture 12 - Excess Thrust and Power
- Lecture 13 - Review
- Lecture 14 - Thrust Required
- Lecture 15 - Modeling of CL
- Lecture 16 - A Closer Look
- Lecture 17 - Estimation of Drag Polar Through Flight Test
- Lecture 18 - Estimation of Rate of Climb
- Lecture 19 - Revision.
- Lecture 20 - Range and Endurance
- Lecture 21 - Range and Endurance
- Lecture 22 - Gliding Flight
- Lecture 23 - Accelerated Flight
- Lecture 24 - V-n Diagram
- Lecture 25 - Revision..
- Lecture 26 - V stall
- Lecture 27 - Flaps
- Lecture 28 - Take off
- Lecture 29 - Take off Performance

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

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- Lecture 30 - Take off Performance
- Lecture 31 - Revision...
- Lecture 32 - Landing Performance
- Lecture 33 - Landing Performance
- Lecture 34 - Challenges in Takeoff and Landing
- Lecture 35 - Introduction to Static Stability
- Lecture 36 - Positioning of Center of Pressure for Static Stability
- Lecture 37 - Revision.....
- Lecture 38 - Stability and Control
- Lecture 39 - Stability and Control
- Lecture 40 - Longitudinal Control
- Lecture 41 - Contribution of Wing and Tail
- Lecture 42 - Stability
- Lecture 43 - Control
- Lecture 44 - Control
- Lecture 45 - Control
- Lecture 46 - Design Basics
- Lecture 47 - Design Basics
- Lecture 48 - Revision.

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

NPTEL Video Course - Aerospace Engineering - NOC:Stability and control of aircraft

Subject Co-ordinator - Dr. A.K. Ghosh

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction  
Lecture 2 - Introduction to Static Stability  
Lecture 3 - Stability and Trim  
Lecture 4 - Stability  
Lecture 5 - Stability  
Lecture 6 - Problems  
Lecture 7 - Problems  
Lecture 8 - Neutral Point and Fuselage Contribution Completed  
Lecture 9 - Longitudinal Control Completed  
Lecture 10 - Longitudinal Control (Continued...)  
Lecture 11 - Control  
Lecture 12 - CL\_trim Vs  $e_{trim}$   
Lecture 13 - Neutral Point  
Lecture 14 - Contribution of Engine towards Stability  
Lecture 15 - Revision  
Lecture 16 - Trim  
Lecture 17 - Trim  
Lecture 18 - Maneuvering Point  
Lecture 19 - Numerical  
Lecture 20 - Revision (Lecture20)  
Lecture 21 - Directional Stability  
Lecture 22 - Directional Control  
Lecture 23 - Lateral Stability and Control  
Lecture 24 - Numericals  
Lecture 25 - Lecture - 25 Revision  
Lecture 26 - Stick Free Stability  
Lecture 27 - Stick Free Stability (Continued...)  
Lecture 28 - Hinge Moment and Hinge Moment Derivative  
Lecture 29 - Aircraft Handling Qualities

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

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- Lecture 30 - Aircraft Handling Qualities (Continued...)
- Lecture 31 - Reversible Control
- Lecture 32 - Numericals
- Lecture 33 - Numericals
- Lecture 34 - Handling Qualities
- Lecture 35 - Determination of Neutral Point and Maneuvering Point by Flight Experiment
- Lecture 36 - Ponit Mass Equation of Motion
- Lecture 37 - Forces and Moments
- Lecture 38 - Aircraft Equations of Motion
- Lecture 39 - Six Degrees of Freedom of an Aircraft
- Lecture 40 - 6 DoF
- Lecture 41 - Vector in a Rotating Frame
- Lecture 42 - Euler Angles
- Lecture 43 - Small Perturbation Theory
- Lecture 44 - Small Perturbation Theory (Continued...)
- Lecture 45 - Perturbed Equations of Motion
- Lecture 46 - Perturbed Force
- Lecture 47 - Perturbed Force
- Lecture 48 - Perturbed Pitching Moment
- Lecture 49 - Longitudinal Dimensional Stability Derivatives
- Lecture 50 - Dynamic Stability
- Lecture 51 - Longitudinal Modes
- Lecture 52 - Short Period and Phugoid Approximations
- Lecture 53 - Pure Pitching Motion
- Lecture 54 - Stability Augmentation System (SAS)
- Lecture 55 - Lateral-Directional Motion
- Lecture 56 - Tutorial - 1
- Lecture 57 - Tutorial - 2
- Lecture 58 - Tutorial - 3
- Lecture 59 - Tutorial - 4
- Lecture 60 - History of Aviation

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

NPTEL Video Course - Aerospace Engineering - NOC:Engineering Thermodynamics

Subject Co-ordinator - Dr. D.P. Mishra

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Thermodynamics and its Applications
- Lecture 2 - System and its Surroundings
- Lecture 3 - Property of System
- Lecture 4 - Energy and its Various Forms
- Lecture 5 - Concepts of Equilibrium and its State
- Lecture 6 - Energy and its Interactions
- Lecture 7 - Heat Interactions
- Lecture 8 - Thermodynamic Properties of Fluids - 1
- Lecture 9 - Thermodynamic Properties of Fluids - 2
- Lecture 10 - Thermodynamic Properties of Fluids - 3
- Lecture 11 - Thermodynamic Properties of Fluids - 4
- Lecture 12 - Thermodynamic Properties of Fluids - 5
- Lecture 13 - First Law of Thermodynamics for Cyclic Process
- Lecture 14 - First Law of Thermodynamics for Non-cyclic Process - 1
- Lecture 15 - First Law of Thermodynamics for Non-cyclic Process - 2
- Lecture 16 - Control Mass and Control Volume
- Lecture 17 - First Law of Thermodynamics for Steady Flow Processes
- Lecture 18 - First Law of Thermodynamics for Unsteady Flow Processes
- Lecture 19 - First Law of Thermodynamics to Reacting Systems
- Lecture 20 - Second Law of Thermodynamics
- Lecture 21 - Second Law of Thermodynamics
- Lecture 22 - Second Law of Thermodynamics
- Lecture 23 - Second Law of Thermodynamics
- Lecture 24 - Applications of Second Law of Thermodynamics
- Lecture 25 - Applications of Second Law of Thermodynamics
- Lecture 26 - Exergy
- Lecture 27 - Gas Turbine Cycle
- Lecture 28 - Vapor Power Cycle - 1
- Lecture 29 - Vapor Power Cycle - 2

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

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- Lecture 30 - Vapor Power Cycle - 3
- Lecture 31 - Gas Power Cycles - 1
- Lecture 32 - Gas Power Cycles - 2
- Lecture 33 - Refrigeration Cycles
- Lecture 34 - Non-Reacting Mixture and Psychrometry
- Lecture 35 - Gas-Vapor Mixture and Air Conditioning - 1
- Lecture 36 - Gas-Vapor Mixture and Air Conditioning - 2
- Lecture 37 - Thermodynamic Property Relations - 1
- Lecture 38 - Thermodynamic Property Relations - 2

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

NPTEL Video Course - Aerospace Engineering - NOC:Aircraft Dynamic Stability and Design Stability Augmentation

Subject Co-ordinator - Dr. A.K. Ghosh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Dynamic Stability
- Lecture 2 - Spring-Mass-Damper System
- Lecture 3 - Spring-Mass-Damper System
- Lecture 4 - Laplace Transform
- Lecture 5 - Pitch Dynamics
- Lecture 6 - Numericals
- Lecture 7 - Aircraft Rigid Body Equation of Motion
- Lecture 8 - Six Degree of Freedom Equation of Motion
- Lecture 9 - Vector in Rotating Frame
- Lecture 10 - Forces and Moments on Aircraft
- Lecture 11 - Euler Angles
- Lecture 12 - Trajectory of the Aircraft
- Lecture 13 - Small Perturbation Theory
- Lecture 14 - Perturbed Aerodynamic Forces and Moments
- Lecture 15 - U-derivatives
- Lecture 16 - Alpha - derivatives
- Lecture 17 - Alpha Dot Derivatives
- Lecture 18 - q and delta Derivatives
- Lecture 19 - Dimensional Stability Derivatives
- Lecture 20 - Longitudinal Characteristic Equation
- Lecture 21 - Routh's Criteria and Longitudinal Dynamic Stability
- Lecture 22 - Longitudinal Modes
- Lecture 23 - Short period Mode Approximation
- Lecture 24 - Long Period Mode (Phugoid) Approximation
- Lecture 25 - Lateral Directional Stability Derivatives
- Lecture 26 - Lateral Directional Stability Derivatives (Continued...)
- Lecture 27 - Perturbed Equation of Motion for Lateral Dynamics
- Lecture 28 - Modes of Lateral Directional Dynamics
- Lecture 29 - Spiral and Dutch Roll modes Approximation

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

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- Lecture 30 - Routh's Hurwitz Stability Criterion
- Lecture 31 - Introduction to Stability Augmentation
- Lecture 32 - Pure Yawing and Pure Rolling Motion
- Lecture 33 - SAS for Longitudinal Dynamics
- Lecture 34 - SAS for Lateral Dynamics
- Lecture 35 - Flight Handling Qualities
- Lecture 36 - Numericals
- Lecture 37 - Revision
- Lecture 38 - Mode Shape
- Lecture 39 - Mode Shape
- Lecture 40 - Numericals
- Lecture 41 - Stability Augmentation System
- Lecture 42 - Numericals
- Lecture 43 - Numericals

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Ancient Indian Technology

Subject Co-ordinator - Dr. D.P. Mishra

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Ancient Indian Civilization
- Lecture 2 - Ancient Indian Civilization's Gift to the World
- Lecture 3 - Why do we need to look at Ancient Indian Science and Technology?
- Lecture 4 - Glimpses of Ancient Indian Science and Technology
- Lecture 5 - Brief Review of Ancient Indian Scriptures
- Lecture 6 - Basic Principles of carrying out science and technology
- Lecture 7 - Arrays of Physics, chemistry and Indoor games
- Lecture 8 - Marvels of Ancient Indian Technology
- Lecture 9 - Introduction to Indian Agriculture
- Lecture 10 - Problems arising due to modern agricultural practices
- Lecture 11 - Pesticides and soil degradation
- Lecture 12 - Agriculture - A Primary Productive Activity
- Lecture 13 - An Agricultural Tools - A Plough
- Lecture 14 - Soil and seeds
- Lecture 15 - Sowing Methods
- Lecture 16 - Indigenous cattle and manuring
- Lecture 17 - Ancient Indian Textile Technology
- Lecture 18 - Handlooms and Charkha
- Lecture 19 - Different types of Handlooms
- Lecture 20 - Ancient Rural Indian Housing
- Lecture 21 - Thatched Roof House
- Lecture 22 - Rural Walls and Roof materials
- Lecture 23 - Indus Valley and Harappan Civilization
- Lecture 24 - First and Second of Indian Civilization
- Lecture 25 - Town topologies and Brick and Tile making process
- Lecture 26 - Availability of Water and Freshwater
- Lecture 27 - Ancient Indian Wells
- Lecture 28 - Temple Water tanks and Dams
- Lecture 29 - Tank Irrigation system and Rainwater Harvesting

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

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- Lecture 30 - Waterbodies - Lakes and Canals
- Lecture 31 - Sluices and Embankments
- Lecture 32 - World of Materials
- Lecture 33 - Metals - Gold Silver Lead
- Lecture 34 - History of Copper
- Lecture 35 - Iron during Vedic period
- Lecture 36 - Iron smelting process in ancient India
- Lecture 37 - Iron and Steel crafts in ancient India
- Lecture 38 - Extraction and smelting of Zinc in Ancient India
- Lecture 39 - Metal Casting in Ancient India
- Lecture 40 - Glass Technology in Ancient India

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Experiments in Flight

Subject Co-ordinator - Prof. Mahendra Verma, Dr. A.K. Ghosh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Weighment and Calculation of CG (Theory)
- Lecture 2 - Cruise Experiment (Theory)
- Lecture 3 - Weighment Experiment and cockpit panel description
- Lecture 4 - Drag Polar Experiment
- Lecture 5 - CG and Climb Experiment
- Lecture 6 - Calibration of Control Surface
- Lecture 7 - Calibration of Control Surfaces (Experiment)
- Lecture 8 - Introduction to Flight Data Recorder
- Lecture 9 - Sensors - Part I
- Lecture 10 - Sensors - Part II
- Lecture 11 - Data Acquisition using MEMS devices
- Lecture 12 - Estimation of Stick-Fixed Neutral Point
- Lecture 13 - Estimation of Stick-Free Neutral Point and Stick-Free Maneuvering Point
- Lecture 14 - Static
- Lecture 15 - Static
- Lecture 16 - Steady Coordinated Turn
- Lecture 17 - Introduction to Parameter Estimation
- Lecture 18 - Parameter Estimation using Least Squares Method
- Lecture 19 - Aerodynamic Parameter Estimation using Least Squares Method
- Lecture 20 - Aerodynamic Parameter Estimation using Delta Method
- Lecture 21 - Aerodynamic Parameter Estimation using Delta Method (Continued...)

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

NPTEL Video Course - Aerospace Engineering - NOC:Engineering Thermodynamics (2017)

Subject Co-ordinator - Dr. Jayant K. Singh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Fundamental laws of nature, system definitions and applications
- Lecture 2 - Thermodynamic property, state, equilibrium and process
- Lecture 3 - Temperature scale and pressure
- Lecture 4 - Macroscopic and microscopic forms of energy
- Lecture 5 - Different forms of work, energy transfer and sign convention
- Lecture 6 - First law of thermodynamics and energy balance
- Lecture 7 - Efficiency of mechanical and electrical devices
- Lecture 8 - Examples on basic concept and energy balance
- Lecture 9 - Phase change of a pure substance
- Lecture 10 - Property diagrams of pure substances
- Lecture 11 - Thermodynamic properties of a pure substance from a property table
- Lecture 12 - Thermodynamic properties of a pure substance
- Lecture 13 - Equations of state and compressibility chart
- Lecture 14 - Examples on properties of pure substances
- Lecture 15 - Quasi equilibrium, moving boundary work
- Lecture 16 - Polytropic process
- Lecture 17 - Energy analysis of closed system and unrestrained expansion
- Lecture 18 - Internal energy, enthalpy, and specific heats of ideal gas
- Lecture 19 - Internal energy, enthalpy, and specific heats of solids and liquids
- Lecture 20 - Examples on energy balance for closed systems and moving boundary work
- Lecture 21 - Conservation of mass and steady flow processes
- Lecture 22 - Flow work and energy of flowing fluid
- Lecture 23 - Energy balance for steady flow devices
- Lecture 24 - Throttling valve, mixing chamber and heat exchanger
- Lecture 25 - Energy analysis of steady and unsteady flow devices
- Lecture 26 - Examples on mass and energy analysis of open systems
- Lecture 27 - Second law of thermodynamics, heat engine and cyclic devices
- Lecture 28 - COP of refrigerator and heat pump, second law statements
- Lecture 29 - Perpetual motion machines, reversible and irreversible processes, Carnot cycle

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

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- Lecture 30 - Carnot principles, thermodynamic temperature scale, Carnot HE and HP
- Lecture 31 - Examples on second law of thermodynamics
- Lecture 32 - Clausius inequality, application of second law
- Lecture 33 - Entropy, increase in entropy principle, isentropic process
- Lecture 34 - Change in entropy of solids, liquids and ideal gases
- Lecture 35 - Reversible flow work, multistage compressor, efficiency of pump and compressors
- Lecture 36 - Entropy balance in closed system and control volume
- Lecture 37 - Examples on entropy change in a system
- Lecture 38 - Exergy and second law efficiency
- Lecture 39 - Exergy of a fixed mass and flowing stream
- Lecture 40 - Exergy transfer due to heat, mass and work, exergy destruction
- Lecture 41 - Exergy balance and second law efficiency for closed systems and steady flow devices
- Lecture 42 - Examples related to exergy change and exergy destruction
- Lecture 43 - Gas power cycles and air-standard assumptions
- Lecture 44 - An overview of reciprocating engines and otto cycle
- Lecture 45 - Analysis of Diesel cycle
- Lecture 46 - Analysis of Brayton cycle
- Lecture 47 - Examples on gas power cycles such as Otto, Diesel and Brayton
- Lecture 48 - Rankin and Carnot vapour power cycles
- Lecture 49 - Ideal regenerative Rankin cycle and combined gas-vapour cycle
- Lecture 50 - Refrigeration cycles
- Lecture 51 - Examples on vapour power cycles
- Lecture 52 - Thermodynamic property relations
- Lecture 53 - Thermodynamic property relations
- Lecture 54 - Thermodynamic property relations
- Lecture 55 - Combustion and conservation of mass in a chemical reaction
- Lecture 56 - Energy balance for reacting systems
- Lecture 57 - Enthalpy of formation and combustion, adiabatic flame temperature
- Lecture 58 - Examples on property relations and reaction thermodynamics



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

NPTEL Video Course - Aerospace Engineering - NOC:Aircraft Design

Subject Co-ordinator - Dr. A.K. Ghosh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction
- Lecture 2 - Wing Loading and Thrust Loading
- Lecture 3 - Basic Design - Lift and Drag
- Lecture 4 - Range and Endurance
- Lecture 5 - Mission Requirements
- Lecture 6 - Range and Endurance
- Lecture 7 - Fuel Consumption
- Lecture 8 - L/D for Maximum Range and Endurance
- Lecture 9 - Range and endurance for Jet-driven Aircraft
- Lecture 10 - Estimation of Fuel for a Mission
- Lecture 11 - Design Considerations
- Lecture 12 - Design Considerations
- Lecture 13 - Design Considerations
- Lecture 14 - Wing Design
- Lecture 15 - Wing Design
- Lecture 16 - Wing Design
- Lecture 17 - Wing Design
- Lecture 18 - Wing Arrangements
- Lecture 19 - Tail Arrangements
- Lecture 20 - Tail Arrangements (Continued...)
- Lecture 21 - Aircraft Structure
- Lecture 22 - Wing Loading and Power Loading
- Lecture 23 - Thrust Loading and Wing Loading
- Lecture 24 - Thrust Loading
- Lecture 25 - Wing Loading
- Lecture 26 - Wing Loading
- Lecture 27 - Take off
- Lecture 28 - Take off
- Lecture 29 - Wing Loading

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

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- Lecture 30 - Revision (Wing Loading and Thrust Loading)
- Lecture 31 - Numerical
- Lecture 32 - Wing Loading
- Lecture 33 - Stability Considerations
- Lecture 34 - Static Stability Basics
- Lecture 35 - Wing and tail contribution to Longitudinal Static Stability
- Lecture 36 - Conceptual Design
- Lecture 37 - Conceptual design (Continued...)
- Lecture 38 - Elevator Effectiveness
- Lecture 39 - Elevator Effectiveness (Continued...)
- Lecture 40 - Numerical - Pitching moment
- Lecture 41 - Numerical - Elevator Effectiveness
- Lecture 42 - Aircraft Maintenance Guidelines
- Lecture 43 - Inspection for Aircraft
- Lecture 44 - Numerical of Weight Fraction
- Lecture 45 - Inspection of Sinus 912 Motor Glider
- Lecture 46 - Numericals

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

NPTEL Video Course - Aerospace Engineering - NOC:Fundamentals Of Combustion-I

Subject Co-ordinator - Dr. D.P. Mishra

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to fundamentals of combustion
- Lecture 2 - Scope and applications of combustion
- Lecture 3 - Scope of combustion (Continued...) and types of fuel and oxidizers
- Lecture 4 - Characterization of liquid and gaseous fuel
- Lecture 5 - Properties of liquid and solid fuels, various modes of combustion
- Lecture 6 - Thermodynamics of combustion
- Lecture 7 - Thermodynamics of combustion (Continued...)
- Lecture 8 - Laws of thermodynamics and Stoichiometry
- Lecture 9 - Stoichiometric calculations for air-gas mixture
- Lecture 10 - Mixture fraction calculation for diffusion flames
- Lecture 11 - Thermochemistry
- Lecture 12 - Heat of reaction and bond energy
- Lecture 13 - Adiabatic flame temperature
- Lecture 14 - Adiabatic flame temperature and its effect on various parameters
- Lecture 15 - Introduction to chemical equilibrium
- Lecture 16 - Chemical equilibrium and Gibbs free energy
- Lecture 17 - Equilibrium constants and Le chatlier principle
- Lecture 18 - Determination of chemical equilibrium composition
- Lecture 19 - Chemical and reaction kinetics
- Lecture 20 - Compact notation and reaction rate of chemical reaction
- Lecture 21 - Collision Theory
- Lecture 22 - Collision theory (Continued...)
- Lecture 23 - Collision frequency of molecules
- Lecture 24 - Specific reaction rate and Arrhenius law
- Lecture 25 - First order, Second order and Third-order reactions
- Lecture 26 - Classification of chemical reactions
- Lecture 27 - Elementary chain reactions
- Lecture 28 - Quasi-steady state and partial equilibrium approximation
- Lecture 29 - Physics of combustion

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

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- Lecture 30 - Transport equations and molecular model for transport process
- Lecture 31 - Mean free path length
- Lecture 32 - Lennard-Jones potential model for diffusivity
- Lecture 33 - Lennard-Jones potential model (Continued...)
- Lecture 34 - Mass conservation law
- Lecture 35 - Momentum conservation equation
- Lecture 36 - Introduction to mass transfer
- Lecture 37 - Species transport equation
- Lecture 38 - Energy conservation equation
- Lecture 39 - Conserved scalar approach for one dimensional flows
- Lecture 40 - Introduction to turbulent combustion

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

NPTEL Video Course - Aerospace Engineering - NOC:Aircraft Maintenance

Subject Co-ordinator - Dr. A.K. Ghosh

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Rules and Regulations for Civil Aviation in India
- Lecture 2 - Rules and Regulations for Civil Aviation in India (Continued...)
- Lecture 3 - Aircraft Hydraulic System
- Lecture 4 - Aircraft Fuel System
- Lecture 5 - Aircraft Landing Gear System
- Lecture 6 - Aircraft Wheels
- Lecture 7 - Aircraft Brakes System
- Lecture 8 - Basic Aircraft Design
- Lecture 9 - Aircraft Electrical System
- Lecture 10 - Aircraft Electrical Circuit
- Lecture 11 - Inspection of Aircraft
- Lecture 12 - Maintenance Schedule
- Lecture 13 - Maintenance Schedule (Continued...)
- Lecture 14 - Inspection of Cessna 206

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

NPTEL Video Course - Aerospace Engineering - NOC:Fundamentals of Combustion - Part 2

Subject Co-ordinator - Dr. D.P. Mishra

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Combustion Modes and Classification of Flames
- Lecture 2 - Analysis of One Dimensional Combustion Wave
- Lecture 3 - Analysis of One Dimensional Combustion Wave (Continued...)
- Lecture 4 - Introduction to Laminar Premixed Flame
- Lecture 5 - Structure of One Dimensional Premixed Flame
- Lecture 6 - Laminar Flame Theory for Premixed Flames
- Lecture 7 - Laminar Flame Theory for Premixed Flames (Continued...)
- Lecture 8 - Determination of Laminar Burning Velocity for Premixed Flames
- Lecture 9 - Flame Thickness and Burning Velocity Measurement Methods
- Lecture 10 - Stationary Flame Method for Burning Velocity Measurement
- Lecture 11 - Effects of Chemical and Physical Variables on Burning Velocity
- Lecture 12 - Effects of Chemical and Physical Variables on Burning Velocity (Continued...)
- Lecture 13 - Effect of Inert Additives on Burning Velocity and Flame Extinction
- Lecture 14 - Simplified Analysis for Quenching Diameter
- Lecture 15 - Flammability Limits and Flame Stabilization
- Lecture 16 - Ignition in Premixed Flames
- Lecture 17 - Introduction to Turbulent Premixed Flames
- Lecture 18 - Turbulent Burning Velocity and Premixed Flame Regimes
- Lecture 19 - Introduction to Gaseous Jet Diffusion Flame
- Lecture 20 - Phenomenological Analysis of a Laminar Jet Diffusion Flame
- Lecture 21 - Theoretical Analysis of a Two-Dimensional Diffusion Flame
- Lecture 22 - Theoretical Analysis of a Two-Dimensional Diffusion Flame (Continued...)
- Lecture 23 - Flame Height Estimation and Smoke point in Diffusion Flames
- Lecture 24 - Mechanism of Soot Formation and Introduction to Liquid Fuel Combustion
- Lecture 25 - Introduction to Droplet Combustion
- Lecture 26 - Liquid Droplet Combustion
- Lecture 27 - Droplet Combustion (Continued...)
- Lecture 28 - Droplet Combustion in Convective Environment
- Lecture 29 - Droplet Combustion in Convective Environment and Introduction to Spray Combustion Mode

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

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- Lecture 30 - Spray Combustion Model
- Lecture 31 - Introduction to Solid Fuel Combustion
- Lecture 32 - Solid Fuel Combustion (Continued...)
- Lecture 33 - Diffusional theory for Carbon Combustion
- Lecture 34 - Carbon Burning Rate
- Lecture 35 - Carbon Burning Rate (Continued...)
- Lecture 36 - Carbon Sphere in Convective Environment
- Lecture 37 - Combustion and Effects on Environment
- Lecture 38 - Chemicals from Combustion
- Lecture 39 - Emission Control Methods
- Lecture 40 - Combustion Modification Methods

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

NPTEL Video Course - Aerospace Engineering - NOC:Design of Fixed Wing Unmanned Aerial Vehicles

Subject Co-ordinator - Prof. Saderla Subrahmanyam

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction, course content and classification of UAVs
- Lecture 2 - Measurement of Flight Velocity and Standard Atmosphere
- Lecture 3 - Anatomy of Airplane and Airfoil Nomenclature
- Lecture 4 - Examples, Pitot and static tube and differential pressure sensor
- Lecture 5 - Generation of Lift and Drag
- Lecture 6 - Aerodynamic center and center of pressure, Various wing planform
- Lecture 7 - Lifting line theory, NACA airfoil nomenclature
- Lecture 8 - Airfoil and Finite wing, Various wing planform
- Lecture 9 - Interpreting airfoil data,  $C_l$  vs  $\alpha$  and drag polar, selection of airfoil
- Lecture 10 - Introduction to Airplane performance, Equation of motion
- Lecture 11 - Thrust required and Power required
- Lecture 12 - Calculation of Performance parameters and selection of power plant
- Lecture 13 - Climb Performance, Engine Sizing and Power Plant selection
- Lecture 14 - Weight Estimation, Common propulsion systems
- Lecture 15 - Weight Estimation contd., Electric propulsion, Battery Sizing
- Lecture 16 - Iterative weight estimation and Wing sizing
- Lecture 17 - Wing Planform selection and sizing and Flight test of Cropped delta wing UAVs
- Lecture 18 - Effect of variation of CG location and Static Stability
- Lecture 19 - C.G. location and Longitudinal Static stability
- Lecture 20 - Tutorial 1
- Lecture 21 - Contribution of tail in static stability and Neutral point.
- Lecture 22 - Tutorial 2
- Lecture 23 - Tutorial 3

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Finite Volume Methods-I

Subject Co-ordinator - Prof. Ashoke De

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Finite Volume Method
- Lecture 2 - Governing Equations and Discretization
- Lecture 3 - Boundary Conditions and Classification of PDEs
- Lecture 4 - Mathematical Description of fluid flow - I
- Lecture 5 - Mathematical description of fluid flow - II
- Lecture 6 - Discretization Process - I
- Lecture 7 - Discretization Process - II
- Lecture 8 - Discretization Process - III
- Lecture 9 - Taylor Series - I
- Lecture 10 - Taylor Series - II
- Lecture 11 - Derivatives and Errors - I
- Lecture 12 - Derivatives and errors - II
- Lecture 13 - Grid Transformation
- Lecture 14 - Finite Volume Formulation - I
- Lecture 15 - Finite Volume Formulation - II
- Lecture 16 - Properties of discretized equations
- Lecture 17 - Introduction to Finite Volume Mesh
- Lecture 18 - Structured Mesh System
- Lecture 19 - Unstructured Mesh System - I
- Lecture 20 - Unstructured Mesh System - II
- Lecture 21 - Properties of Unstructured Mesh - I
- Lecture 22 - Properties of Unstructured Mesh - II
- Lecture 23 - Finite Volume discretization of Diffusion Equation - I
- Lecture 24 - Finite Volume discretization of Diffusion equation - II
- Lecture 25 - Finite Volume discretization of Diffusion equation - III
- Lecture 26 - Discretization of Diffusion Equation for Cartesian orthogonal systems - I
- Lecture 27 - Discretization of Diffusion Equation for Cartesian orthogonal systems - II
- Lecture 28 - Calculation of Diffusivity
- Lecture 29 - Discretization of Diffusion Equation for non-Cartesian orthogonal systems - I

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

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- Lecture 30 - Discretization of Diffusion Equation for non-orthogonal systems - I
- Lecture 31 - Discretization of Diffusion Equation for non-orthogonal systems - II
- Lecture 32 - Discretization of Diffusion Equation for non-orthogonal systems - III
- Lecture 33 - Gradient Calculation for Diffusion Equation - I
- Lecture 34 - Gradient Calculation for Diffusion Equation - II
- Lecture 35 - Gradient Calculation for Diffusion Equation - III
- Lecture 36 - Properties of matrices - I
- Lecture 37 - Properties of matrices - II
- Lecture 38 - Error Analysis - I
- Lecture 39 - Error Analysis - II
- Lecture 40 - Error Analysis - III

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

NPTEL Video Course - Aerospace Engineering - NOC:Advance Aircraft Maintenance

Subject Co-ordinator - Dr. A.K. Ghosh, Mr. V. Mathur

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Engines
- Lecture 2 - Introduction to Engines (Continued...)
- Lecture 3 - Construction of Reciprocating Engine
- Lecture 4 - Construction of Reciprocating Engine (Continued...)
- Lecture 5 - Construction of Reciprocating Engine (Continued...)
- Lecture 6 - Lubrication System
- Lecture 7 - Lubrication System Demonstration
- Lecture 8 - Lubrication System (Continued...)
- Lecture 9 - Induction System
- Lecture 10 - Induction System (Continued...)
- Lecture 11 - Cooling System
- Lecture 12 - Exhaust System
- Lecture 13 - Cooling and Exhaust System (Lab Session)
- Lecture 14 - Engine fuel and Fuel Metering Systems
- Lecture 15 - Engine Fuel and Fuel Metering Systems (Continued...)
- Lecture 16 - Engine Fuel and Fuel Metering Systems (Lab Session)
- Lecture 17 - Carburetor troubleshooting and Fuel Injection System
- Lecture 18 - Fuel injection Systems (Continued...)
- Lecture 19 - Fuel System
- Lecture 20 - Ignition system
- Lecture 21 - Ignition system (Continued...)
- Lecture 22 - Ignition system (Lab session)
- Lecture 23 - Basics of propeller and maintenance
- Lecture 24 - Aircraft Reciprocating Engine Inspection - Part 1
- Lecture 25 - Aircraft Reciprocating Engine Inspection - Part 2
- Lecture 26 - Aircraft Reciprocating Engine Inspection - Part 3
- Lecture 27 - Checklist for Aircraft Reciprocating Engine Maintenance
- Lecture 28 - Aircraft Maintenance (Aircraft Performance Point of View)

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Finite Volume Methods-II

Subject Co-ordinator - Prof. Ashoke De

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Linear solvers - I  
Lecture 2 - Linear solvers - II  
Lecture 3 - Linear solvers - III  
Lecture 4 - Linear solvers - IV  
Lecture 5 - Linear solvers - V  
Lecture 6 - Linear solvers - VI  
Lecture 7 - Linear solvers - VII  
Lecture 8 - Linear solvers - VIII  
Lecture 9 - Convection term discretisation - I  
Lecture 10 - Convection term discretisation - II  
Lecture 11 - Convection term discretisation - III (Private)  
Lecture 12 - Convection term discretisation - IV (Private)  
Lecture 13 - Convection term discretisation - V (Private)  
Lecture 14 - Convection term discretisation - VI (Private)  
Lecture 15 - Convection term discretisation - VII (Private)  
Lecture 16 - Convection term discretisation - VIII  
Lecture 17 - Convection term discretisation - IX  
Lecture 18 - High Resolution Schemes - I  
Lecture 19 - High Resolution Schemes - II  
Lecture 20 - High Resolution Schemes - III  
Lecture 21 - High Resolution Schemes - IV  
Lecture 22 - High Resolution Schemes - V  
Lecture 23 - High Resolution Schemes - VI  
Lecture 24 - High Resolution Schemes - VII  
Lecture 25 - Temporal discretisation - I  
Lecture 26 - Temporal discretisation - II  
Lecture 27 - Temporal discretisation - III  
Lecture 28 - Temporal discretisation - IV  
Lecture 29 - Discretisation of the Source Term, Relaxation and Other Details - I

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

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- Lecture 30 - Discretisation of the Source Term, Relaxation and Other Details - II
- Lecture 31 - Fluid Flow Computation
- Lecture 32 - Fluid Flow Computation
- Lecture 33 - Fluid Flow Computation
- Lecture 34 - Fluid Flow Computation
- Lecture 35 - Fluid Flow Computation
- Lecture 36 - Fluid Flow Computation
- Lecture 37 - Fluid Flow Computation
- Lecture 38 - Fluid Flow Computation
- Lecture 39 - Fluid Flow Computation
- Lecture 40 - Some Advanced Topics - I

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Rocket Propulsion

Subject Co-ordinator - Dr. D.P. Mishra

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction

Lecture 2 - A Brief History of Rocket Propulsion and ISRO

Lecture 3 - Types of Rocket Engine

Lecture 4 - Fundamentals of Aero-thermodynamics

Lecture 5 - Control Volume Analysis and Governing Equations

Lecture 6 - Adiabatic Steady 1-D flow and Speed of Sound

Lecture 7 - Basics of Thermochemistry

Lecture 8 - Adiabatic Flame Temperature and Chemical Equilibrium

Lecture 9 - Ideal Rocket Engine, Thrust Equation and Performance Parameters

Lecture 10 - Performance Parameters of Rocket Engine

Lecture 11 - Performance Parameters of Rocket Engine (Continued...)

Lecture 12 - Ideal Nozzle

Lecture 13 - Rocket Nozzle

Lecture 14 - Convergent Nozzle

Lecture 15 - Convergent-Divergent Nozzle and Shock Reflection

Lecture 16 - Effect of Back Pressure and Thrust Coefficient

Lecture 17 - Thrust Coefficient

Lecture 18 - Characteristics Velocity, Combustion Efficiency and Thrust Effectiveness

Lecture 19 - Actual Rocket Nozzle Characteristics

Lecture 20 - Flight Performance of a Rocket Vehicle

Lecture 21 - Flight Performance of a Rocket Vehicle

Lecture 22 - Flight Trajectory of Single Stage Rocket Vehicle

Lecture 23 - Orbital Mechanics

Lecture 24 - Types of Orbits

Lecture 25 - Orbital and Escape Velocity

Lecture 26 - Interplanetary Transfer Path

Lecture 27 - Multi-staging Rocket

Lecture 28 - Chemical Propellants-Characteristics and Classification

Lecture 29 - Solid and Composite Propellants

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

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- Lecture 30 - Composite Propellants and it's Manufacturing
- Lecture 31 - Classification of Liquid Propellants
- Lecture 32 - Solid Propellant Rocket Engine
- Lecture 33 - Propellant Burning Mechanism and Flame Structure
- Lecture 34 - Composite Propellant Combustion
- Lecture 35 - Regression Rate of Solid Propellant and Effect of Operating Parameters
- Lecture 36 - Characteristics of Solid Propellants
- Lecture 37 - Effect of Acceleration and Particle Size on Burning Rate
- Lecture 38 - Erosive Burning, Effect of Propellant Temperature and Thermal Model
- Lecture 39 - Chamber Pressure in Solid Propellant Rocket Engine
- Lecture 40 - Types of Propellant Grains
- Lecture 41 - Types of Solid Propellant Grains and Evolution of Burning Surface
- Lecture 42 - Burning Stability and Ignition System in SPRE
- Lecture 43 - Liquid Propellant Rocket Engine
- Lecture 44 - Injection System in LPRE
- Lecture 45 - Atomization of Liquid Propellants
- Lecture 46 - Types of Injection System in LPRE
- Lecture 47 - Analysis of Impinging Atomizer
- Lecture 48 - Injection Distributor and Combustion Process in LPRE
- Lecture 49 - Variation of Gas Specific Volume and Combustion Chamber Geometry
- Lecture 50 - Liquid Propellant Feed System in LPRE
- Lecture 51 - Turbo-Pump Feed Configuration
- Lecture 52 - Ignition System in LPRE
- Lecture 53 - Cooling of Thrust Chamber and Nozzle of a Rocket Engine
- Lecture 54 - Cooling System of Rocket Engine (Continued...)
- Lecture 55 - Modes of Heat Transfer through combustion Chamber Wall and Nozzle Wall
- Lecture 56 - Heat Transfer Analysis of Cooling System
- Lecture 57 - Hybrid Propellant Rocket Engine
- Lecture 58 - Regression Rate of Solid Fuel Grain in HPRE and Types of Port Configurations
- Lecture 59 - Non-Chemical Rocket Engine
- Lecture 60 - Electromagnetic Thruster, Nuclear and Solar Rocket Engine

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

NPTEL Video Course - Aerospace Engineering - NOC:UAV Design - Part II

Subject Co-ordinator - Prof. Saderla Subrahmanyam

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Introduction to Design Algorithms
- Lecture 2 - Thrust Generation and Power Required
- Lecture 3 - Lift and Drag for Infinite Wing
- Lecture 4 - Lift and Drag for an Infinite Wing (Continued...)
- Lecture 5 - Relation between Aerodynamic center and Center of Pressure
- Lecture 6 - Aerodynamic Characteristics of Wing
- Lecture 7 - Stability and Criteria for Longitudinal Static Stability
- Lecture 8 - Numericals
- Lecture 9 - Longitudinal Static Stability - Wing Contribution
- Lecture 10 - Flight Demonstration of Flat Plate
- Lecture 11 - Numericals (Continued...)
- Lecture 12 - Example Problems for Wing alone Configuration
- Lecture 13 - Wing-Tail Contribution and Neutral Point
- Lecture 14 - Example problems of wing and tail combination
- Lecture 15 - Example problems of wing and tail combination (Continued...)
- Lecture 16 - Flight demonstration of same wing and tail combination
- Lecture 17 - Matlab Tutorial
- Lecture 18 - Trim Requirements of UAV
- Lecture 19 - Example on performance analysis of UAV
- Lecture 20 - Weight Estimation and wing Sizing with Example
- Lecture 21 - Power Plant Selection with Example
- Lecture 22 - Subroutine for takeoff performance (Powerplant selection)
- Lecture 23 - Subroutine for Climb Performance (Powerplant Selection)
- Lecture 24 - Subroutine for Weight Estimation
- Lecture 25 - Subroutine for Planform Geometry Selection
- Lecture 26 - Subroutine for Airfoil Selection

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to Airbreathing Propulsion

Subject Co-ordinator - Prof. Ashoke De

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Introduction  
Lecture 2 - Introduction (Continued...)  
Lecture 3 - Introduction (Continued...)  
Lecture 4 - Review of Fluid Mechanics  
Lecture 5 - Review of Fluid Mechanics, Thermodynamics  
Lecture 6 - Review of Compressible Flows  
Lecture 7 - Review of Compressible Flows (Continued...)  
Lecture 8 - Review of Compressible Flows (Continued...)  
Lecture 9 - Review of Compressible Flows (Continued...)  
Lecture 10 - Review of Compressible Flows (Continued...)  
Lecture 11 - Introduction to gas turbine engines  
Lecture 12 - Introduction to gas turbine engines (Continued...)  
Lecture 13 - Introduction to gas turbine engines (Continued...)  
Lecture 14 - Introduction to gas turbine engines (Continued...)  
Lecture 15 - Introduction to gas turbine engines (Continued...)  
Lecture 16 - Introduction to gas turbine engines (Continued...)  
Lecture 17 - Introduction to gas turbine engines (Continued...)  
Lecture 18 - Piston Engines and Propellers  
Lecture 19 - Piston Engines and Propellers (Continued...)  
Lecture 20 - Piston Engines and Propellers (Continued...)  
Lecture 21 - Piston Engines and Propellers (Continued...)  
Lecture 22 - Piston Engines and Propellers (Continued...)  
Lecture 23 - Piston Engines and Propellers (Continued...)  
Lecture 24 - Performance/cycle analysis  
Lecture 25 - Performance/cycle analysis  
Lecture 26 - Performance/cycle analysis  
Lecture 27 - Performance/cycle analysis  
Lecture 28 - Performance/cycle analysis  
Lecture 29 - Performance/cycle analysis

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- Lecture 30 - Performance/cycle analysis
- Lecture 31 - Performance/cycle analysis
- Lecture 32 - Performance/cycle analysis
- Lecture 33 - Performance/cycle analysis
- Lecture 34 - Performance/cycle analysis
- Lecture 35 - Performance/cycle analysis
- Lecture 36 - Stationary components
- Lecture 37 - Stationary components
- Lecture 38 - Stationary components
- Lecture 39 - Introduction to turbomachinery
- Lecture 40 - Centrifugal compressor
- Lecture 41 - Centrifugal compressor (Continued...)
- Lecture 42 - Centrifugal compressor (Continued...)
- Lecture 43 - Centrifugal compressor (Continued...)
- Lecture 44 - Centrifugal compressor (Continued...)
- Lecture 45 - Centrifugal compressor (Continued...)
- Lecture 46 - Centrifugal compressor (Continued...)
- Lecture 47 - Axial compressor
- Lecture 48 - Axial compressor (Continued...)
- Lecture 49 - Axial compressor (Continued...)
- Lecture 50 - Axial compressor (Continued...)
- Lecture 51 - Axial compressor (Continued...)
- Lecture 52 - Axial compressor (Continued...)
- Lecture 53 - Axial compressor (Continued...)
- Lecture 54 - Axial compressor (Continued...)
- Lecture 55 - Axial turbine
- Lecture 56 - Axial turbine (Continued...)
- Lecture 57 - Axial turbine (Continued...)
- Lecture 58 - Axial turbine (Continued...)
- Lecture 59 - Axial turbine (Continued...)
- Lecture 60 - Radial Flow Turbine, Module Matching

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

NPTEL Video Course - Aerospace Engineering - NOC:Computational Science in Engineering

Subject Co-ordinator - Prof. Ashoke De

Co-ordinating Institute - IIT - Kanpur

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

- Lecture 1 - Linear Algebra: Introduction
- Lecture 2 - Linear Algebra: Introduction (Continued...)
- Lecture 3 - Linear Algebra: Permutation Matrix, Existence of Solution
- Lecture 4 - Linear Algebra: Permutation Matrix, Existence of Solution (Continued...)
- Lecture 5 - Linear Algebra: Linear Independence, Basis Vector and Dimensions
- Lecture 6 - Linear Algebra: Null Space, Column Space, Row Space, Introduction to Orthogonal System
- Lecture 7 - Linear Algebra: Orthogonal System, Projection, Determinant
- Lecture 8 - Linear Algebra: Orthogonal System, Projection, Determinant (Continued...)
- Lecture 9 - Linear Algebra: Properties of Determinant, Cramer's Rule, Introduction to Eigen Values
- Lecture 10 - Linear Algebra: Eigen Values, Eigen Vectors, SVD
- Lecture 11 - Linear Algebra: Eigen Values, Eigen Vectors, SVD (Continued...)
- Lecture 12 - ODE: Introduction to ODEs, Initial Value Problem, Separation of Variables
- Lecture 13 - ODE: Solution of Exact ODEs, First Order Linear Systems
- Lecture 14 - ODE: Solution of Second Order Linear ODEs
- Lecture 15 - ODE: Existence and Uniqueness of Solution, Non-Homogeneous System
- Lecture 16 - ODE: Higher Order Linear ODEs, Variation of Parameters, System of ODEs
- Lecture 17 - ODE: Linear Systems, Superposition for Homogeneous Systems
- Lecture 18 - Fourier Analysis, Orthogonality of Trigonometric Systems, Euler's Formula
- Lecture 19 - Parseval's Theorem, Fourier Integrals, Laplace Transforms
- Lecture 20 - PDE: Introduction to PDEs, Solution of PDEs using Characteristics Curve
- Lecture 21 - PDE: First Order PDEs, Dilation Invariant Solution of Differential Equations
- Lecture 22 - PDE: Solution of Linear PDEs
- Lecture 23 - PDE: Separation of Variables, Eigenvalue Problem, Poisson Integral Representation
- Lecture 24 - PDE: Boundary Conditions, Solution of 2D systems
- Lecture 25 - Introduction to Numerical Methods, Mathematical Models, Errors
- Lecture 26 - Errors, Numerical Differentiation, Stability
- Lecture 27 - Roots of Equations: Graphical Method, Bi-Section Method, False-Position Method
- Lecture 28 - Secant Method, Brent's Method, Multipoint Iteration Method, Derivative Free Method
- Lecture 29 - Complex Roots, Birge-Vieta Method, Bairstow's method

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

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- Lecture 30 - Solution of Linear Algebraic Equations, Gauss Elimination Method
- Lecture 31 - Direct Methods: Gauss Elimination, Gauss-Jordan, Crout's Method, Cholesky Method, Iterative Methods
- Lecture 32 - Extrapolation Method, Eigenvalue Problem, Jacobi Method, Householder's Method for Symmetric Matrices
- Lecture 33 - Interpolation: Taylor's Series, Lagrange and Newton Interpolation, Iterated Interpolation, Hermite Interpolation
- Lecture 34 - Piecewise and Spline Interpolation, Bivariate Interpolation, Least Square Approximation, Uniform Approximation
- Lecture 35 - Numerical Differentiation and Intergration, Methods Based on Finite Differences, Methods based on Taylor's Series
- Lecture 36 - Numerical Integration: Newton-Cotes Method, Gaussian Integration Methods, Lobatto Integration Methods
- Lecture 37 - Double Integration: Trapezoidal Rule, Simpson's Rule, Solution of ODEs: Difference Equation, Single Step Methods
- Lecture 38 - Runge-Kutta Methods, Euler-Cauchy Method, Multi-step Methods, Predictor-Corrector Methods
- Lecture 39 - System of Differential Equations, Stability Analysis, Solution of Boundary Value Problem: Shooting Method
- Lecture 40 - Numerical Approach to Solution of PDEs: Heat Conduction Equation, Convergence and Stability

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

NPTEL Video Course - Aerospace Engineering - High Speed Aero Dynamics

Subject Co-ordinator - Dr. K.P. Sinhamahapatra

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction and Review of Thermodynamics
- Lecture 2 - Review of Thermodynamics (Continued...)
- Lecture 3 - Review of Thermodynamics (Continued...)
- Lecture 4 - Review of Thermodynamics (Continued...)
- Lecture 5 - One-dimensional gas dynamics
- Lecture 6 - One-dimensional gas dynamics (Continued...)
- Lecture 7 - One-dimensional gas dynamics (Continued...)
- Lecture 8 - One-dimensional waves
- Lecture 9 - One-dimensional waves (Continued...)
- Lecture 10 - One-dimensional waves (Continued...)
- Lecture 11 - Waves and Supersonic Flow
- Lecture 12 - Waves and Supersonic Flow (Continued...)
- Lecture 13 - Waves and Supersonic Flow (Continued...)
- Lecture 14 - Waves and Supersonic Flow (Continued...)
- Lecture 15 - Shock Expansion Theory
- Lecture 16 - Flow through ducts and channels
- Lecture 17 - Flow in ducts
- Lecture 18 - Flow in ducts (Continued...)
- Lecture 19 - Adiabatic Flow in ducts with friction
- Lecture 20 - Adiabatic flow in ducts with friction (Continued...)
- Lecture 21 - Isothermal flow in ducts with friction
- Lecture 22 - Flow in uniform duct with heating
- Lecture 23 - Multi - dimensional flow problems
- Lecture 24 - Multi - dimensional flow problems (Continued...)
- Lecture 25 - Linearized flow problems
- Lecture 26 - Linearized flow problems (Continued...)
- Lecture 27 - Linearized flow problems (Continued...)
- Lecture 28 - Linearized flow problems (Continued...)
- Lecture 29 - Linearized flow problems (Continued...)

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

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- Lecture 30 - Linearized flow problems (Continued...)
- Lecture 31 - Linearized flow problems (Continued...)
- Lecture 32 - Linearized Problems - Forces on Slender Bodies
- Lecture 33 - Linearized Problems - Forces on Slender Bodies (Continued...)
- Lecture 34 - Similarity Rules for High Speed Flows
- Lecture 35 - Similarity Rules for High Speed Flows (Continued...)
- Lecture 36 - Similarity Rules for High Speed Flows (Continued...)
- Lecture 37 - Similarity Rules in Hypersonic Flow
- Lecture 38 - Transonic Flow
- Lecture 39 - Transonic Flow (Continued...)
- Lecture 40 - Transonic Flow (Continued...)

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

NPTEL Video Course - Aerospace Engineering - Space Flight Mechanics

Subject Co-ordinator - Dr. Manoranjan Sinha

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction to Space Flight Mechanics
- Lecture 2 - Particle Kinematics
- Lecture 3 - Particle Kinematics (Continued...)
- Lecture 4 - Conic Section
- Lecture 5 - Two Body Problem
- Lecture 6 - Two Body Problem (Continued...1)
- Lecture 7 - Two Body Problem (Continued...2)
- Lecture 8 - Two Body Problem (Continued...3)
- Lecture 9 - Two Body Problem (Continued...4)
- Lecture 10 - Two Body Problem (Continued...5)
- Lecture 11 - Two Body Problem (Continued...6)
- Lecture 12 - Two Body Problem (Continued...7) & Three Body Problem
- Lecture 13 - Three Body Problem (Continued...1)
- Lecture 14 - Three Body Problem (Continued...2)
- Lecture 15 - Three Body Problem (Continued...3)
- Lecture 16 - Three Body Problem (Continued...4)
- Lecture 17 - Three Body Problem (Continued...5)
- Lecture 18 - Three Body Problem (Continued...6)
- Lecture 19 - Three Body Problem (Continued...7)
- Lecture 20 - Three Body Problem (Continued...8)
- Lecture 21 - Trajectory Transfer
- Lecture 22 - Trajectory Transfer (Continued...1)
- Lecture 23 - Trajectory Transfer (Continued...2)
- Lecture 24 - Trajectory Transfer (Continued...3)
- Lecture 25 - Trajectory Transfer (Continued...4)
- Lecture 26 - Trajectory Transfer (Continued...5)
- Lecture 27 - Trajectory Transfer (Continued...6)
- Lecture 28 - Trajectory Transfer (Continued...7)
- Lecture 29 - Trajectory Transfer (Continued...8)

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

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- Lecture 30 - Trajectory Transfer (Continued...9)
- Lecture 31 - Trajectory Transfer (Continued...10)
- Lecture 32 - Trajectory Transfer (Continued...11) and Attitude Dynamics
- Lecture 33 - Attitude Dynamics (Continued...1)
- Lecture 34 - Attitude Dynamics (Continued...2)
- Lecture 35 - Attitude Dynamics (Continued...3)
- Lecture 36 - Attitude Dynamics (Continued...4)
- Lecture 37 - Attitude Dynamics (Continued...5)
- Lecture 38 - Attitude Dynamics (Continued...6)
- Lecture 39 - Attitude Dynamics (Continued...7)
- Lecture 40 - Attitude Dynamics (Continued...8)
- Lecture 41 - Attitude Dynamics (Continued...9)
- Lecture 42 - Propulsion
- Lecture 43 - Propulsion (Continued...1)
- Lecture 44 - Propulsion (Continued...2)
- Lecture 45 - Propulsion (Continued...3)



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

NPTEL Video Course - Aerospace Engineering - Introduction to Aerodynamics

Subject Co-ordinator - Dr. K.P. Sinhamahapatra

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Aircraft and Aerodynamic Forces and Moments
- Lecture 2 - Aircraft and Aerodynamic Forces and Moments (Continued...)
- Lecture 3 - Fluids and Forces in Fluids
- Lecture 4 - Fluids and Forces in Fluids (Continued...)
- Lecture 5 - Forces in Fluids
- Lecture 6 - Forces in Fluids (Continued...)
- Lecture 7 - Kinematics of fluid motion
- Lecture 8 - Kinematics of fluid motion (Continued...)
- Lecture 9 - Kinematics of fluid motion (Continued...)
- Lecture 10 - Kinematics of fluid motion (Continued...)
- Lecture 11 - Kinematics of fluid motion - Velocity with specified extension and vorticity
- Lecture 12 - Kinematics of fluid motion - Velocity with specified extension and vorticity (Continued...)
- Lecture 13 - Kinematics of fluid motion - Vorticity Distribution
- Lecture 14 - Kinematics of fluid motion - Velocity without expansion and vorticity
- Lecture 15 - Irrotational Solenoidal Flow in Multiply Connected region
- Lecture 16 - Irrotational Solenoidal Flow in Multiply Connected region (Continued...)
- Lecture 17 - Equations of Fluid Motion - Navier - Stokes Equation
- Lecture 18 - Equations of Fluid Motion - Navier - Stokes Equation (Continued...)
- Lecture 19 - Equations of Fluid Motion - Navier - Stokes Equation (Continued...)
- Lecture 20 - Conservation of Energy and Energy Equation
- Lecture 21 - Equations of Motions
- Lecture 22 - Equations of Motion (Continued...)
- Lecture 23 - Exact Solution for Simple Problems
- Lecture 24 - Exact Solution for Simple Problems (Continued...)
- Lecture 25 - Non-dimensional Form of the Equations and Possible Simplifications
- Lecture 26 - High Reynolds Number Approximation
- Lecture 27 - Conditions for Incompressibility
- Lecture 28 - Potential Flow
- Lecture 29 - Potential Flow - Combination of Basic Solutions

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

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- Lecture 30 - Potential Flow - Combination of Basic Solutions (Continued...)
- Lecture 31 - Potential Flow - Combination of Basic Solutions (Continued...)
- Lecture 32 - Potential Flow - Combination of Basic Solutions (Continued...) - Lifting Cylinder
- Lecture 33 - Conformal Transformation
- Lecture 34 - Conformal Transformation (Continued...)
- Lecture 35 - Zhukovsky Transformation
- Lecture 36 - Zhukovsky Transformation (Continued...)
- Lecture 37 - Zhukovsky Transformation - Applications
- Lecture 38 - Zhukovsky Transformation - Applications (Continued...)
- Lecture 39 - Zhukovsky Transformation - Applications (Continued...)
- Lecture 40 - Transformation
- Lecture 41 - Transformation (Continued...)
- Lecture 42 - Boundary - Layer Theory
- Lecture 43 - Boundary - Layer Theory (Continued...)
- Lecture 44 - Boundary - Layer Theory (Continued...)
- Lecture 45 - Boundary - Layer Theory (Continued...)
- Lecture 46 - Boundary - Layer Theory (Continued...)

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

NPTEL Video Course - Aerospace Engineering - NOC:Satellite Attitude Dynamics and Control

Subject Co-ordinator - Dr. Manoranjan Sinha

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Kinematics of Rotation  
Lecture 2 - Kinematics of Rotation (Continued...)  
Lecture 3 - Kinematics of Rotation (Continued...)  
Lecture 4 - Kinematics of Rotation (Continued...)  
Lecture 5 - Kinematics of Rotation (Continued...)  
Lecture 6 - Kinematics of Rotation (Continued...)  
Lecture 7 - Rotation  
Lecture 8 - Rotation (Continued...)  
Lecture 9 - Rotation (Continued...)  
Lecture 10 - Rotation (Continued...)  
Lecture 11 - Rotational Kinematics  
Lecture 12 - Rotational Kinematics (Continued...)  
Lecture 13 - Rotational Kinematics (Continued...)  
Lecture 14 - Rotational Kinematics (Continued...)  
Lecture 15 - Rotational Dynamics (Rigid Body Dynamics)  
Lecture 16 - Rotational Dynamics (Rigid Body Dynamics) (Continued...)  
Lecture 17 - Rotational Dynamics (Rigid Body Dynamics) (Continued...)  
Lecture 18 - Rigid Body Dynamics  
Lecture 19 - Rigid Body Dynamics (Continued...)  
Lecture 20 - Rigid Body Dynamics (Continued...)  
Lecture 21 - Rigid Body Dynamics (Continued...)  
Lecture 22 - Rigid Body Dynamics (Continued...)  
Lecture 23 - Rigid Body Dynamics (Continued...)  
Lecture 24 - Rigid Body Dynamics (Continued...)  
Lecture 25 - Rigid Body Dynamics (Continued...)  
Lecture 26 - Stability of Torque Free Rotation  
Lecture 27 - Stability of Torque Free Rotation (Continued...)  
Lecture 28 - Gravity-gradient Satellite  
Lecture 29 - Gravity-gradient Satellite (Continued...)

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- Lecture 30 - Gravity-gradient Satellite (Continued...)
- Lecture 31 - Gravity-gradient Satellite (Continued...)
- Lecture 32 - Gravity-gradient Satellite (Continued...)
- Lecture 33 - Gravity-gradient Satellite (Continued...)
- Lecture 34 - Gravity-gradient Satellite (Continued...)
- Lecture 35 - Gravity-gradient Satellite (Continued...)
- Lecture 36 - Gravity-gradient Satellite (Continued...)
- Lecture 37 - Gravity-gradient Satellite (Continued...)
- Lecture 38 - Spin Stabilization
- Lecture 39 - Spin Stabilization (Continued...)
- Lecture 40 - Spin Stabilization (Continued...)
- Lecture 41 - Spin Stabilization (Continued...)
- Lecture 42 - Spin Stabilization (Continued...)
- Lecture 43 - Control Moment Gyroscope
- Lecture 44 - Control Moment Gyroscope (Continued...)
- Lecture 45 - Gyroscope/Top Motion
- Lecture 46 - Gyroscope/Top Motion (Continued...)
- Lecture 47 - Gyroscopic Motion
- Lecture 48 - Gyroscopic Motion (Continued...)
- Lecture 49 - Reaction Wheel/Gyrostat
- Lecture 50 - Reaction Wheel/Gyrostat (Continued...)
- Lecture 51 - Gyrostat
- Lecture 52 - Gyrostat (Continued...)
- Lecture 53 - Gyrostat (Continued...)
- Lecture 54 - Gyrostat (Continued...)
- Lecture 55 - Control Moment Gyro
- Lecture 56 - Control Moment Gyro (Continued...)
- Lecture 57 - Control Moment Gyro (Continued...)
- Lecture 58 - Control Moment Gyro (Continued...)
- Lecture 59 - Satellite Dynamics with Control Moment Gyro
- Lecture 60 - Satellite Dynamics with Control Moment Gyro (Continued...)
- Lecture 61 - Satellite Dynamics with Control Moment Gyro (Continued...)
- Lecture 62 - Simplified Control Gyro for Satellite Attitude Control
- Lecture 63 - Satellite Attitude Control using Magnetic Torquer
- Lecture 64 - Satellite Attitude Control using Magnetic Torquer (Continued...)
- Lecture 65 - Satellite Attitude Control using Magnetic Torquer (Continued...)
- Lecture 66 - Satellite Attitude Control using Magnetic Torquer (Continued...)
- Lecture 67 - Satellite Attitude Control using Magnetic Torquer (Continued...)
- Lecture 68 - Satellite Attitude Control using Lorentz Force

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

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- Lecture 69 - Satellite Attitude Control using Thruster
- Lecture 70 - Atmospheric Drag on the Satellite
- Lecture 71 - Atmospheric Force and Moment on the Satellite
- Lecture 72 - Atmospheric Force and Moment on the Satellite (Continued...)
- Lecture 73 - Solar Radiation Force and Moment on the Satellite

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

NPTEL Video Course - Aerospace Engineering - NOC:Vibration and Structural Dynamics

Subject Co-ordinator - Prof. Mira Mitra

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Introduction
- Lecture 2 - Undamped Free Vibration
- Lecture 3 - Damped Free Vibration
- Lecture 4 - Damped Free Vibration (Continued...)
- Lecture 5 - Damped Free Vibration (Continued...)
- Lecture 6 - Force Vibration
- Lecture 7 - Harmonic Loading
- Lecture 8 - Harmonic Loading (Continued...)
- Lecture 9 - Harmonic Loading (Continued...)
- Lecture 10 - Harmonic Loading (Continued...)
- Lecture 11 - Impulse Load and Arbitrary Load
- Lecture 12 - Impulse Load and Arbitrary Load (Continued...)
- Lecture 13 - MDOF, 2-Dof System
- Lecture 14 - Normal Mode of Vib
- Lecture 15 - Natural Frequency and Mode Shapes
- Lecture 16 - Mode Shapes of MDOF
- Lecture 17 - Mode Shapes and Free Vibration Response of MDOF
- Lecture 18 - Example on MDOF
- Lecture 19 - Example on MDOF (Continued...)
- Lecture 20 - Modal Expansion Theorem, Generalized Coordinate
- Lecture 21 - Examples on Modal Analysis
- Lecture 22 - Damping
- Lecture 23 - Rigid Body Modes
- Lecture 24 - Numerical Time Integration
- Lecture 25 - Continuous System
- Lecture 26 - Axial Vibration of Bar
- Lecture 27 - Axial Vibration of Bar (Continued...)
- Lecture 28 - Bending Vibration in Beam
- Lecture 29 - Bending Vibration in Beam (Continued...)

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

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- Lecture 30 - Bending Vibration in Beam (Continued...)
- Lecture 31 - Modal Analysis
- Lecture 32 - Modal Analysis (Continued...)
- Lecture 33 - Modal Analysis of Continuous System
- Lecture 34 - Modal Analysis of Continuous System (Continued...)
- Lecture 35 - Approximate Method
- Lecture 36 - Approximate Methods (Continued...)
- Lecture 37 - Collocation Method
- Lecture 38 - Analytical Methods
- Lecture 39 - Analytical Methods (Continued...)
- Lecture 40 - Analytical Methods (Continued...)

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

NPTEL Video Course - Aerospace Engineering - NOC:Space Flight Mechanics

Subject Co-ordinator - Dr. Manoranjan Sinha

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Conic Section
- Lecture 2 - Conic Section (Continued...)
- Lecture 3 - Conic Section (Continued...)
- Lecture 4 - Central Force Motion
- Lecture 5 - Gravitational Central Force Motion
- Lecture 6 - Gravitational Central Force Motion (Continued...)
- Lecture 7 - Gravitational Central Force Motion (Continued...)
- Lecture 8 - 2-Body Problem
- Lecture 9 - 2-Particle System Motion Under Mutual Gravitational Attraction
- Lecture 10 - 2-Particle Body Problem
- Lecture 11 - 2-Particle Body System
- Lecture 12 - Classical Orbital Elements / Parameters
- Lecture 13 - Classical Orbital Elements / Parameters (Continued...)
- Lecture 14 - Classical Orbital Elements / Parameters (Continued...)
- Lecture 15 - Classical Orbital Elements and Its Inverse Problems
- Lecture 16 - Inverse Problem of Orbit Determination (Classical Orbital Elements)
- Lecture 17 - Problem Solving on 2-Body Problem Related to Orbit and Orbital Elements
- Lecture 18 - Problem Related to Orbital Elements
- Lecture 19 - Kepler's Equation / Kepler's Problem
- Lecture 20 - Kepler's Problem (Continued...)
- Lecture 21 - Kepler's Problem (Continued...)
- Lecture 22 - Kepler's Equation
- Lecture 23 - Kepler's Equation (Continued...)
- Lecture 24 - Kepler's Equation (Continued...)
- Lecture 25 - Kepler's Equation (Continued...)
- Lecture 26 - Kepler's Equation (Continued...)
- Lecture 27 - Kepler's Equation (Continued...)
- Lecture 28 - Kepler's Equation (Continued...)
- Lecture 29 - 3-Body Problem

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- Lecture 30 - 3-Body Problem (Continued...)
- Lecture 31 - 3-Body Problem (Continued...)
- Lecture 32 - 3-Body Problem (Continued...)
- Lecture 33 - 3-Body Problem (Continued...)
- Lecture 34 - Restricted 3-Body Problem
- Lecture 35 - Restricted 3-Body Problem (Continued...)
- Lecture 36 - Restricted 3-Body Problem (Continued...)
- Lecture 37 - Restricted 3-Body Problem (Continued...)
- Lecture 38 - Restricted 3-Body Problem (Continued...)
- Lecture 39 - Restricted 3-Body Problem (Continued...)
- Lecture 40 - Restricted 3-Body Problem (Continued...)
- Lecture 41 - Restricted 3-Body Problem (Continued...)
- Lecture 42 - Restricted 3-Body Problem (Continued...)
- Lecture 43 - Restricted 3-Body Problem (Continued...)
- Lecture 44 - Restricted 3-Body Problem (Continued...)
- Lecture 45 - Restricted 3-Body Problem (Continued...)
- Lecture 46 - Restricted 3-Body Problem (Continued...)
- Lecture 47 - General Perturbation Theory
- Lecture 48 - General Perturbation Theory (Continued...)
- Lecture 49 - General Perturbation Theory (Continued...)
- Lecture 50 - General Perturbation Theory (Continued...)
- Lecture 51 - General Perturbation Theory (Continued...)
- Lecture 52 - General Orbit Perturbation Theory
- Lecture 53 - General Orbit Perturbation Theory (Continued...)
- Lecture 54 - General Orbit Perturbation Theory (Continued...)
- Lecture 55 - General Orbit Perturbation Theory (Continued...)
- Lecture 56 - General Orbit Perturbation Theory (Continued...)
- Lecture 57 - General Orbit Perturbation Theory (Continued...)
- Lecture 58 - General Orbit Perturbation Theory (Continued...)
- Lecture 59 - General Orbit Perturbation Theory (Continued...)
- Lecture 60 - General Orbit Perturbation Theory (Continued...)
- Lecture 61 - General Orbit Perturbation Theory (Continued...)
- Lecture 62 - General Orbit Perturbation Theory (Continued...)
- Lecture 63 - General Orbit Perturbation Theory (Continued...)
- Lecture 64 - General Orbit Perturbation Theory (Continued...)
- Lecture 65 - General Orbit Perturbation Theory (Continued...)
- Lecture 66 - General Orbit Perturbation Theory (Continued...)
- Lecture 67 - General Orbit Perturbation Theory (Continued...)
- Lecture 68 - Orbit Determination

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

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- Lecture 69 - Orbit Determination (Continued...)
- Lecture 70 - Orbit Determination (Continued...)
- Lecture 71 - Orbit Determination (Continued...)
- Lecture 72 - Transformation from Celestial to Earth Fixed Reference Frame
- Lecture 73 - Time
- Lecture 74 - Time (Continued...)
- Lecture 75 - Orbit Determination
- Lecture 76 - Orbit Determination (Continued...)
- Lecture 77 - Orbit Determination (Continued...)
- Lecture 78 - Orbit Determination (Continued...)
- Lecture 79 - Trajectory Transfer
- Lecture 80 - Trajectory Transfer (Continued...)
- Lecture 81 - Trajectory Transfer (Continued...)
- Lecture 82 - Trajectory Transfer (Continued...)
- Lecture 83 - Trajectory Transfer (Continued...)
- Lecture 84 - Trajectory Transfer (Continued...)
- Lecture 85 - Trajectory Transfer (Continued...)
- Lecture 86 - Trajectory Transfer (Continued...)
- Lecture 87 - Interplanetary Transfer
- Lecture 88 - Interplanetary Transfer (Continued...)
- Lecture 89 - Interplanetary Transfer (Continued...)
- Lecture 90 - Patched Conic Section Method for Interplanetary Transfer
- Lecture 91 - Interplanetary Mission
- Lecture 92 - Interplanetary Mission (Continued...)
- Lecture 93 - Interception in Coplanar Orbit
- Lecture 94 - Interception in Coplanar Orbit (Continued...)
- Lecture 95 - Interception in non-coplanar Orbit
- Lecture 96 - Interception in non-coplanar Orbit (Continued...)
- Lecture 97 - Interception in non-coplanar Orbit (Continued...)
- Lecture 98 - Non Coplanar Transfer
- Lecture 99 - Sphere of Influence

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

NPTEL Video Course - Aerospace Engineering - NOC:Aircraft Structures - I

Subject Co-ordinator - Dr. Anup Ghosh

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 - Load Encountered by a Typical Aircraft
- Lecture 5 - Conceptual Structural Details of a Typical Aircraft
- Lecture 6 - Airworthiness of An Aircraft
- Lecture 7 - Aerodynamic Loads and Load Factors
- Lecture 8 - Loads From A Symmetric Manoeuvre Of An Aircraft
- Lecture 9 - Shear and Moment on Wing An Aircraft
- Lecture 10 - Distribution Of Load On The Fuselage
- Lecture 11 - Unit Load Analysis Of Fuselage
- Lecture 12 - Truss System
- Lecture 13 - Truss System (Continued...)
- Lecture 14 - Space Structures
- Lecture 15 - Space Structures (Continued...)
- Lecture 16 - Wing Truss System
- Lecture 17 - Introduction to Energy Methods
- Lecture 18 - Dummy and Unit Load Method
- Lecture 19 - Dummy and Unit Load Method - Examples
- Lecture 20 - Castigliano's Theorems
- Lecture 21 - Rayleigh - Ritz Method
- Lecture 22 - Statically Indeterminate Structures
- Lecture 23 - Theory of Elasticity - Stress
- Lecture 24 - Theory of Elasticity - Equilibrium
- Lecture 25 - Stress Transformation and Principal Stress
- Lecture 26 - Theory of Elasticity - Principal Stress Boundary Condition
- Lecture 27 - Shear Stresses
- Lecture 28 - Introduction of Strain
- Lecture 29 - Introduction of strain - Equations of compatibility

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

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- Lecture 30 - Formulation of Elasticity Problems
- Lecture 31 - Inverse Method of Solution
- Lecture 32 - Semi-Inverse Method of Solution
- Lecture 33 - Equilibrium Equation in Polar Coordinate System
- Lecture 34 - Compatibility Condition in Polar Coordinate System
- Lecture 35 - Effects of Circular Hole on Stress Distributions in a Plate
- Lecture 36 - Effects of Circular Hole on Stress Distributions in a Plate
- Lecture 37 - Effects of Circular Hole on Stress Distributions in a Plate
- Lecture 38 - Theory of Elasticity - Torsion Problems
- Lecture 39 - Theory of Elasticity - Torsion Problems (Continued...)
- Lecture 40 - Torsion of an Elliptical Bar
- Lecture 41 - Membrane Analogy for Torsion Problem
- Lecture 42 - Membrane Analogy for Torsion Problem (Continued...)

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

NPTEL Video Course - Aerospace Engineering - NOC:Introduction to CFD

Subject Co-ordinator - Prof. Arnab Roy

Co-ordinating Institute - IIT - Kharagpur

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

- Lecture 1 - Brief Overview of CFD
- Lecture 2 - Governing Equations of Fluid Flow
- Lecture 3 - Governing Equations of Fluid Flow (Continued...)
- Lecture 4 - Classification of PDEs
- Lecture 5 - Classification of PDEs (Continued...)
- Lecture 6 - Methods for Approximate Solution of PDEs
- Lecture 7 - Finite Difference Method
- Lecture 8 - Methods for Approximate Solution of PDEs (Continued...)
- Lecture 9 - Methods for Approximate Solution of PDEs (Continued...)
- Lecture 10 - Methods for Approximate Solution of PDEs (Continued...)
- Lecture 11 - Methods for Approximate Solution of PDEs (Continued...)
- Lecture 12 - Taylor Table Approach for Constructing Finite Difference Schemes
- Lecture 13 - Taylor Table Approach for Constructing Finite Difference Schemes (Continued...)
- Lecture 14 - Taylor Table Approach for Constructing Finite Difference Schemes (Continued...)
- Lecture 15 - Taylor Table Approach for Constructing Finite Difference Schemes (Continued...)
- Lecture 16 - Taylor Table Approach for Constructing Finite Difference Schemes (Continued...)
- Lecture 17 - Numerical Solution of Steady State Heat Conduction (Elliptic PDE)
- Lecture 18 - Numerical Solution of Steady State Heat Conduction (Elliptic PDE) (Continued...)
- Lecture 19 - Numerical Solution of Steady State Heat Conduction (Elliptic PDE) (Continued...)
- Lecture 20 - Numerical Solution of Steady State Heat Conduction (Elliptic PDE) (Continued...)
- Lecture 21 - Numerical Solution of Steady State Heat Conduction (Elliptic PDE) (Continued...)
- Lecture 22 - Numerical Solution of Unsteady Heat Conduction (Parabolic PDE)
- Lecture 23 - Numerical Solution of Unsteady Heat Conduction (Parabolic PDE) (Continued...)
- Lecture 24 - Numerical Solution of Unsteady Heat Conduction (Parabolic PDE) (Continued...)
- Lecture 25 - Numerical Solution of Unsteady Heat Conduction (Parabolic PDE) (Continued...)
- Lecture 26 - Numerical Solution of Unsteady Heat Conduction (Parabolic PDE) (Continued...)
- Lecture 27 - Numerical Solution of Linear Wave Equation (Hyperbolic PDE)
- Lecture 28 - Numerical Solution of Linear Wave Equation (Hyperbolic PDE) (Continued...)
- Lecture 29 - Numerical Solution of Linear Wave Equation (Hyperbolic PDE) (Continued...)

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

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- Lecture 30 - Numerical Solution of Linear Wave Equation (Hyperbolic PDE) (Continued...)
- Lecture 31 - Numerical Solution of Linear Wave Equation (Hyperbolic PDE) (Continued...)
- Lecture 32 - Numerical Solution of Linear Wave Equation (Hyperbolic PDE) (Continued...)
- Lecture 33 - Numerical Solution of One Dimensional Convection - Diffusion Equation
- Lecture 34 - Numerical Solution of One Dimensional Convection - Diffusion Equation (Continued...)
- Lecture 35 - Numerical Solution of One Dimensional Convection - Diffusion Equation (Continued...)
- Lecture 36 - Numerical Solution of One Dimensional Convection - Diffusion Equation (Continued...)
- Lecture 37 - Numerical Solution of One Dimensional Convection - Diffusion Equation (Continued...)
- Lecture 38 - Numerical Solution of One Dimensional Convection - Diffusion Equation (Continued...)
- Lecture 39 - Numerical Solution of Two Dimensional Incompressible Navier Stokes Equations
- Lecture 40 - Numerical Solution of Two Dimensional Incompressible Navier Stokes Equations (Continued...)
- Lecture 41 - Numerical Solution of Two Dimensional Incompressible Navier Stokes Equations (Continued...)
- Lecture 42 - Numerical Solution of Two Dimensional Incompressible Navier Stokes Equations (Continued...)
- Lecture 43 - Numerical Solution of Two Dimensional Incompressible Navier Stokes Equations (Continued...)
- Lecture 44 - Numerical Solution of Two Dimensional Incompressible Navier Stokes Equations (Continued...)
- Lecture 45 - Numerical Solution of One Dimensional Euler Equation for Shock Tube Problem
- Lecture 46 - Numerical Solution of One Dimensional Euler Equation for Shock Tube Problem (Continued...)
- Lecture 47 - Numerical Solution of One Dimensional Euler Equation for Shock Tube Problem (Continued...)
- Lecture 48 - Numerical Solution of One Dimensional Euler Equation for Shock Tube Problem (Continued...)
- Lecture 49 - Numerical Solution of One Dimensional Euler Equation for Shock Tube Problem (Continued...)
- Lecture 50 - Basics of Interface Capturing Methods for Applications in Multiphase Flow
- Lecture 51 - Basics of Interface Capturing Methods for Application in Multiphase Flow (Continued...)
- Lecture 52 - Basics of Interface Capturing Methods for Application in Multiphase Flow (Continued...)
- Lecture 53 - Basics of Interface Capturing Methods for Application in Multiphase Flow (Continued...)
- Lecture 54 - Basics of Interface Capturing Methods for Application in Multiphase Flow (Continued...)
- Lecture 55 - Basics of Turbulence Modeling
- Lecture 56 - Basics of Turbulence Modeling (Continued...)
- Lecture 57 - Basics of Turbulence Modeling (Continued...)
- Lecture 58 - Basics of Turbulence Modeling (Continued...)
- Lecture 59 - Basics of Turbulence Modeling (Continued...)
- Lecture 60 - Basics of Turbulence Modeling (Continued...)
- Lecture 61 - Structured and Unstructured Grid Generation
- Lecture 62 - Structured and Unstructured Grid Generation (Continued...)
- Lecture 63 - Structured and Unstructured Grid Generation (Continued...)
- Lecture 64 - Structured and Unstructured Grid Generation (Continued...)
- Lecture 65 - Structured and Unstructured Grid Generation (Continued...)

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

NPTEL Video Course - Aerospace Engineering - Acoustic Instabilities in Aerospace Propulsion

Subject Co-ordinator - Prof. R.I. Sujith

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Thermoacoustic Instabilities  
Lecture 2 - Part I  
Lecture 3 - Wave Equation and its Solution in Time Domain  
Lecture 4 - Part I  
Lecture 5 - Standing Waves - 1  
Lecture 6 - Standing Waves - 2  
Lecture 7 - Power Flow and Acoustic Admittance  
Lecture 8 - Impedance Tube Technique  
Lecture 9 - Admittance and Standing Waves  
Lecture 10 - Admittance, Stability and Attenuation  
Lecture 11 - Attenuation  
Lecture 12 - Sound Propagation Through Inhomogeneous Media - 2  
Lecture 13 - Sound Propagation Through Inhomogeneous Media - 3  
Lecture 14 - Multidimensional Acoustic Fields - 1  
Lecture 15 - Multidimensional Acoustic Fields - 2  
Lecture 16 - Interaction between Sound and Combustion  
Lecture 17 - Reference Books Derivation of Rayleigh Criteria  
Lecture 18 - Effect of Heat release on the Acoustic Field  
Lecture 19 - Modal Analysis of Thermoacoustic Instability - 1  
Lecture 20 - Modal Analysis of Thermoacoustic Instability - 2  
Lecture 21 - Active Control of Thermoacoustic Instability  
Lecture 22 - Toy model for a Rijke tube in Time Domain  
Lecture 23 - Galerkin Technique for Thermoacoustics  
Lecture 24 - Evolution Equation for Thermoacoustics  
Lecture 25 - Non linear analysis of Thermoacoustic Instability  
Lecture 26 - Non-normality, Transient Growth and Triggering Instability - 1  
Lecture 27 - Non-normality, Transient Growth and Triggering Instability - 2  
Lecture 28 - Non-normality, Transient Growth and Triggering Instability - 3  
Lecture 29 - Bifurcations

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

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- Lecture 30 - Premixed Flame Acoustic Interaction - 1
- Lecture 31 - Premixed Flame Acoustic Interaction - 2
- Lecture 32 - Combustion instability due to Equivalence Ratio Fluctuation
- Lecture 33 - Role of Hydrodynamic Instabilities - 1
- Lecture 34 - Role of Hydrodynamic Instabilities - 2
- Lecture 35 - Role of Hydrodynamic Instabilities - 3
- Lecture 36 - Active Control of Thermoacoustic Instability Revisited
- Lecture 37 - Solid Propellant Combustion Instability - 1
- Lecture 38 - Solid Propellant Combustion Instability - 2
- Lecture 39 - Response of a Diffusion Flame to Acoustic Oscillations - 1
- Lecture 40 - Response of a Diffusion Flame to Acoustic Oscillations - 2
- Lecture 41 - Response of a Diffusion Flame to Acoustic Oscillations - 3



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

NPTEL Video Course - Aerospace Engineering - Aerospace Propulsion

Subject Co-ordinator - Dr. P.A. Ramakrishna

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Air breathing Engines - Turbojet I
- Lecture 3 - Air breathing Engines - Turbojet II
- Lecture 4 - Air breathing Engines - Turboprop & Turbofan
- Lecture 5 - Air breathing Engines - Ramjet & Scramjet
- Lecture 6 - Non-air breathing Engines I
- Lecture 7 - Non-air breathing Engines II
- Lecture 8 - General Performance Parameters I
- Lecture 9 - General Performance Parameters II
- Lecture 10 - Cycle Analysis - Ramjet
- Lecture 11 - Cycle Analysis - Turbojet I
- Lecture 12 - Cycle Analysis - Turbojet II
- Lecture 13 - Cycle Analysis - Turbojet III
- Lecture 14 - Cycle Analysis - Turbojet IV
- Lecture 15 - Cycle Analysis - Turbojet V
- Lecture 16 - Cycle Analysis - Turbojet VI
- Lecture 17 - Cycle Analysis - Turbofan
- Lecture 18 - Rocket Nozzles - 1D Analysis I
- Lecture 19 - Rocket Nozzles - 1D Analysis II
- Lecture 20 - Rocket Nozzles - 1D Analysis III
- Lecture 21 - Rocket Nozzles - Real Effects I
- Lecture 22 - Rocket Nozzles - Real Effects II
- Lecture 23 - Rocket Nozzles - Thrust Vectoring
- Lecture 24 - Solid Rockets - Propellants
- Lecture 25 - Solid Rockets - Burn rate
- Lecture 26 - Solid Rockets - Performance
- Lecture 27 - Solid Rockets - Grain
- Lecture 28 - Solid Rockets - Ignition, Quenching
- Lecture 29 - Solid Rockets - Igniter, Depressurization

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

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- Lecture 30 - Propellant Combustion - Combustion Modelling
- Lecture 31 - Liquid Rocket - Propellants
- Lecture 32 - Liquid Rocket - Nozzle Cooling I
- Lecture 33 - Liquid Rocket - Nozzle Cooling II
- Lecture 34 - Liquid Rocket - Nozzle Cooling III
- Lecture 35 - Liquid Rocket - Pressure fed system
- Lecture 36 - Liquid Rocket - Pump fed system
- Lecture 37 - Liquid Rocket - Pumps
- Lecture 38 - Liquid Rocket - Fuel Injection
- Lecture 39 - Hybrid Rocket - Basics
- Lecture 40 - Hybrid Rocket Performance
- Lecture 41 - Hybrid Rocket Combustion
- Lecture 42 - Chemical Equilibrium Analyser - SP 273

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

NPTEL Video Course - Aerospace Engineering - Combustion

Subject Co-ordinator - Prof. S.R. Chakravarthy

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction

Lecture 2 - Chemical Reactions, Heats of Reaction and Formation

Lecture 3 - Sensible Enthalpy and Adiabatic Flame Temperature

Lecture 4 - Dissociation of Products, Role of Pressure

Lecture 5 - Numerical Calculation of Adiabatic Flame Temperature, Chemical Kinetics 1

Lecture 6 - Chemical Kinetics 2

Lecture 7 - Equilibrium Reactions, Global Kinetics, Order of Reaction

Lecture 8 - Reduced Chemistry, Steady State Approximation

Lecture 9 - Steady State Approximation, Partial Equilibrium Approximation

Lecture 10 - Partial Equilibrium Approximation, Chemical Explosions

Lecture 11 - Combining Chemical and Thermal Processes 1

Lecture 12 - Combining Chemical and Thermal Processes 2

Lecture 13 - Combining Chemical and Thermal Processes 3

Lecture 14 - Combining Chemical and Thermal Processes 4

Lecture 15 - Mass and Molar Diffusion, Fick's Law

Lecture 16 - Conservation Equations for Multi-Component Mixtures

Lecture 17 - Multi-Component Diffusion Equation

Lecture 18 - Multi-Component Momentum Equation

Lecture 19 - Energy Equation

Lecture 20 - One Dimensional Steady Flow

Lecture 21 - Schvab-Zeldovich Formulation 1

Lecture 22 - Schvab-Zeldovich Formulation 2

Lecture 23 - Rankine-Hugoniot Relations 1

Lecture 24 - Rankine-Hugoniot Relations 2

Lecture 25 - Rankine-Hugoniot Relations 3

Lecture 26 - Velocity, Temperature and Entropy Variation along Hugoniot Curve

Lecture 27 - Laminar Premixed Flames

Lecture 28 - Laminar Premixed Flames - Corrections

Lecture 29 - Laminar Premixed Flames - Rigorous Analysis 1

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

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- Lecture 30 - Laminar Premixed Flames - Rigorous Analysis 2
- Lecture 31 - Flame Speed Dependencies, G-Equation
- Lecture 32 - Bunsen Burner 1
- Lecture 33 - Bunsen Burner 2
- Lecture 34 - Flame Stabilisation 1
- Lecture 35 - Flame Stabilisation 2
- Lecture 36 - Ignition
- Lecture 37 - Burke-Schumann Problem 1
- Lecture 38 - Burke-Schumann Problem 2
- Lecture 39 - Burke-Schumann Problem 3
- Lecture 40 - Flame Structure
- Lecture 41 - Mixture Fraction Formulation 1
- Lecture 42 - Mixture Fraction Formulation 2
- Lecture 43 - Droplet Burning 1
- Lecture 44 - Droplet Burning 2
- Lecture 45 - Spray Combustion 1
- Lecture 46 - Spray Combustion 2
- Lecture 47 - Turbulent Combustion 1
- Lecture 48 - Turbulent Combustion 2
- Lecture 49 - Combustion Instabilities
- Lecture 50 - Detonations
- Lecture 51 - Detonation Wave - ZND Structure

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

NPTEL Video Course - Aerospace Engineering - Flight Dynamics II (Stability)

Subject Co-ordinator - Dr. Nandan Kumar Sinha

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Earth Atmosphere, Aircraft components, Aircraft nomenclature
- Lecture 2 - Basic aerodynamics
- Lecture 3 - Equilibrium and stability
- Lecture 4 - Static vs dynamic stability
- Lecture 5 - Criterion for stability, Wing contribution
- Lecture 6 - Horizontal tail contribution
- Lecture 7 - Wing plus tail contribution
- Lecture 8 - Static margin and CG limits
- Lecture 9 - Fuselage contribution
- Lecture 10 - Powerplant contribution
- Lecture 11 - Power effects on neutral point
- Lecture 12 - Elevator
- Lecture 13 - Stick free stability, Most fwd CG location
- Lecture 14 - Longitudinal stick force per 'g', Ground effect
- Lecture 15 - Control requirement, Pull-up maneuver, Maneuver point
- Lecture 16 - Elevator per 'g', Maneuver point
- Lecture 17 - Example problems
- Lecture 18 - Lateral-Directional Stability Derivatives, Fuselage/Vertical fin contribution
- Lecture 19 - Roll stability, Wing sweep effect, Rudder
- Lecture 20 - Dihedral effect, Various contributions
- Lecture 21 - Power effects, Roll control, Aileron
- Lecture 22 - Example problems
- Lecture 23 - Derivation of Translational Motion Equations
- Lecture 24 - Derivation of Angular Motion Equations
- Lecture 25 - Description of various forces and moments
- Lecture 26 - Nonlinearities and Associated Aircraft Behavior
- Lecture 27 - Small perturbation method, Linearization of equations
- Lecture 28 - Aerodynamic force and Moment Derivatives
- Lecture 29 - Contribution of Aircraft components to Aerodynamic Derivatives

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

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- Lecture 30 - Linear Model and Aircraft Dynamics Modes
- Lecture 31 - Short Period, Phugoid (Lanchester's formulation)
- Lecture 32 - Short period mode approximation
- Lecture 33 - Flying and Handling Qualities, Cooper Harper Scale
- Lecture 34 - Pure rolling motion, Pure yawing motion, Spiral approximation
- Lecture 35 - Spiral, Roll, Dutch roll Mode approximations
- Lecture 36 - Lateral directional Flying Qualities, Routh's Stability criterion
- Lecture 37 - Stability in Steady Roll Maneuver
- Lecture 38 - Wind Effect on Aircraft Pure Plunging Motion
- Lecture 39 - Wind Profiles, Longitudinal Mode Response to Wind Shear
- Lecture 40 - Stability control/Augmentation
- Lecture 41 - Autopilots, Automatic Landing System

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

NPTEL Video Course - Aerospace Engineering - Gas Dynamics

Subject Co-ordinator - Dr. T.M. Muruganandam

Co-ordinating Institute - IIT - Madras

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

Lecture 1  
Lecture 2  
Lecture 3  
Lecture 4  
Lecture 5  
Lecture 6  
Lecture 7  
Lecture 8  
Lecture 9  
Lecture 10  
Lecture 11  
Lecture 12  
Lecture 13  
Lecture 14  
Lecture 15  
Lecture 16  
Lecture 17  
Lecture 18  
Lecture 19  
Lecture 20  
Lecture 21  
Lecture 22  
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  
Lecture 43  
Lecture 44  
Lecture 45  
Lecture 46  
Lecture 47  
Lecture 48  
Lecture 49  
Lecture 50  
Lecture 51  
Lecture 52  
Lecture 53  
Lecture 54



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

NPTEL Video Course - Aerospace Engineering - Introduction to CFD

Subject Co-ordinator - Prof. M. Ramakrishna

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction, Why and how we need computers
- Lecture 2 - Representing Arrays and functions on computers
- Lecture 3 - Representing functions - Box functions
- Lecture 4 - Representing functions - Polynomials and Hat functions
- Lecture 5 - Hat functions, Quadratic and Cubic representations
- Lecture 6 - Demo - Hat functions, Aliasing
- Lecture 7 - Representing Derivatives - finite differences
- Lecture 8 - Finite differences, Laplace equation
- Lecture 9 - Laplace equation - Jacobi iterations
- Lecture 10 - Laplace equation - Iteration matrices
- Lecture 11 - Laplace equation - convergence rate
- Lecture 12 - Laplace equation - convergence rate Continued
- Lecture 13 - Demo - representation error, Laplace equation
- Lecture 14 - Demo - Laplace equation, SOR
- Lecture 15 - Laplace equation - final, Linear Wave equation
- Lecture 16 - Linear wave equation - Closed form and numerical solution, stability analysis
- Lecture 17 - Generating a stable scheme and Boundary conditions
- Lecture 18 - Modified equation
- Lecture 19 - Effect of higher derivative terms on Wave equation
- Lecture 20 - Artificial dissipation, upwinding, generating schemes
- Lecture 21 - Demo - Modified equation, Wave equation
- Lecture 22 - Demo - Wave equation / Heat Equation
- Lecture 23 - Quasi-linear One-Dimensional. wave equation
- Lecture 24 - Shock speed, stability analysis, Derive Governing equations
- Lecture 25 - One-Dimensional Euler equations - Attempts to decouple
- Lecture 26 - Derive Eigenvectors, Writing Programs
- Lecture 27 - Applying Boundary conditions
- Lecture 28 - Implicit Boundary conditions
- Lecture 29 - Flux Vector Splitting, setup froms averaging

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

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- Lecture 30 - Roes averaging
- Lecture 31 - Demo - One Dimensional flow
- Lecture 32 - Accelerating convergence - Preconditioning, dual time stepping
- Lecture 33 - Accelerating convergence - Intro to Multigrid method
- Lecture 34 - Multigrid method
- Lecture 35 - Multigrid method - final, Parallel Computing
- Lecture 36 - Calculus of Variations - Three Lemmas and a Theorem
- Lecture 37 - Calculus of Variations - Application to Laplace Equation
- Lecture 38 - Calculus of Variations - Final and Random Walk
- Lecture 39 - Overview and Recap of the course

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

NPTEL Video Course - Aerospace Engineering - NOC:Rocket Propulsion

Subject Co-ordinator - Prof. K. Ramamurthi, Prof. S. Varunkumar

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Motion in Space
- Lecture 3 - Rotational Frame of Reference and Orbital Velocities
- Lecture 4 - Velocity Requirements
- Lecture 5 - Theory of rocket propulsion
- Lecture 6 - Rocket Equation and Staging of Rockets
- Lecture 7 - Review of Rocket Principles
- Lecture 8 - Examples Illustrating Theory of Rocket Propulsion and Introduction to Nozzles
- Lecture 9 - Theory of Nozzles
- Lecture 10 - Nozzle Shape
- Lecture 11 - Area Ratio of Nozzles
- Lecture 12 - Characteristic Velocity and Thrust Coefficient
- Lecture 13 - Divergence Loss in Conical Nozzles and the Bell Nozzles
- Lecture 14 - Unconventional Nozzles and Problems in Nozzles
- Lecture 15 - Criterion for Choice of Chemical Propellants
- Lecture 16 - Choice of Fuel-Rich Propellants
- Lecture 17 - Performance Prediction Analysis
- Lecture 18 - Factors Influencing Choice of Chemical Propellants
- Lecture 19 - Low energy liquid propellants and Hybrid propellants Chapter 5
- Lecture 20 - Introduction to Solid Propellant Rockets
- Lecture 21 - Burn Rate of Solid Propellants and Equilibrium Pressure in Solid Propellant Rockets
- Lecture 22 - Design Aspects of Solid Propellant Rockets
- Lecture 23 - Burning Surface Area of Solid Propellant Grains
- Lecture 24 - Ignition of Solid Propellant Rockets
- Lecture 25 - Review of Solid Propellant Rockets
- Lecture 26 - Feed Systems for Liquid Propellant Rockets
- Lecture 27 - Feed System Cycles for Pump Fed Liquid Propellant Rockets
- Lecture 28 - Analysis of Gas Generator and Staged combustion cycles and introduction to injectors
- Lecture 29 - Injectors, Cooling of Chambers and Mixture Ratio Distribution

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

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- Lecture 30 - Efficiencies due to mixture ratio distribution and incomplete vaporization
- Lecture 31 - Pumps and Turbines
- Lecture 32 - Review of Liquid Bi-propellant Rockets and Introduction to Mono-propellant Rockets
- Lecture 33 - Introduction to Hybrid Rockets and a Simple Illustration of Combustion instability in Liquid Prop
- Lecture 34 - Principles of Electrostatic and Electromagnetic Rockets
- Lecture 35 - Electrical Thrusters
- Lecture 36 - Electrical and Nuclear Rockets; Advanced Propulsion

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

NPTEL Video Course - Aerospace Engineering - Advanced Control System Design for Aerospace Vehicles

Subject Co-ordinator - Dr. Radhakant Padhi

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction and Motivation for Advanced Control Design
- Lecture 2 - Classical Control Overview - I
- Lecture 3 - Classical Control Overview - II
- Lecture 4 - Classical Control Overview - III
- Lecture 5 - Classical Control Overview - IV
- Lecture 6 - Basic Principles of Atmospheric Flight Mechanics
- Lecture 7 - Overview of Flight Dynamics - I
- Lecture 8 - Overview of Flight Dynamics - II
- Lecture 9 - Representation of Dynamical Systems - I
- Lecture 10 - Representation of Dynamical Systems - II
- Lecture 11 - Representation of Dynamical Systems - III
- Lecture 12 - Review of Matrix Theory - I
- Lecture 13 - Review of Matrix Theory - II
- Lecture 14 - Review of Matrix Theory - III
- Lecture 15 - Review of Numerical Methods
- Lecture 16 - Linearization of Nonlinear Systems
- Lecture 17 - First and Second Order Linear Differential Equations
- Lecture 18 - Time Response of Linear Dynamical Systems
- Lecture 19 - Stability of Linear Time Invariant Systems
- Lecture 20 - Controllability and Observability of linear Time Invariant Systems
- Lecture 21 - Pole Placement Control Design
- Lecture 22 - Pole Placement Observer Design
- Lecture 23 - Static Optimization
- Lecture 24 - Calculus of Variations
- Lecture 25 - Optimal Control Formulation using Calculus of Variations
- Lecture 26 - Classical Numerical Methods for Optimal Control
- Lecture 27 - Linear Quadratic Regulator (LQR) Design - 1
- Lecture 28 - Linear Quadratic Regulator (LQR) Design - 2
- Lecture 29 - Linear Control Design Techniques in Aircraft Control - I

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

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- Lecture 30 - Linear Control Design Techniques in Aircraft Control - II
- Lecture 31 - Lyapunov Theory - I
- Lecture 32 - Lyapunov Theory - II
- Lecture 33 - Constructions of Lyapunov Functions
- Lecture 34 - Dynamic Inversion - I
- Lecture 35 - Dynamic Inversion - II
- Lecture 36 - Neuro-Adaptive Design - I
- Lecture 37 - Neuro-Adaptive Design - II
- Lecture 38 - Neuro-Adaptive Design for Flight Control
- Lecture 39 - Integrator Back-Stepping; Linear Quadratic (lQ) Observer
- Lecture 40 - An Overview of Kalman Filter Theory

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

NPTEL Video Course - Aerospace Engineering - Optimal Control, Guidance and Estimation

Subject Co-ordinator - Dr. Radhakant Padhi

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Introduction, Motivation and Overview

Lecture 2 - Overview of SS Approach and Matrix Theory

Lecture 3 - Review of Numerical Methods

Lecture 4 - An Overview of Static Optimization - I

Lecture 5 - An Overview of Static Optimization - II

Lecture 6 - Review of Calculus of Variations - I

Lecture 7 - Review of Calculus of Variations - II

Lecture 8 - Optimal Control Formulation Using Calculus of Variations

Lecture 9 - Classical Numerical Methods to Solve Optimal Control Problems

Lecture 10 - Linear Quadratic Regulator (LQR) - I

Lecture 11 - Linear Quadratic Regulator (LQR) - II

Lecture 12 - Linear Quadratic Regulator (LQR) - III

Lecture 13 - Linear Quadratic Regulator (LQR) - III

Lecture 14 - Discrete-time Optimal Control

Lecture 15 - Overview of Flight Dynamics - I

Lecture 16 - Overview of Flight Dynamics - II

Lecture 17 - Overview of Flight Dynamics - III

Lecture 18 - Linear Optimal Missile Guidance using LQR

Lecture 19 - SDRE and  $\hat{I}$ , - D Designs

Lecture 20 - Dynamic Programming

Lecture 21 - Approximate Dynamic Programming (ADP), Adaptive Critic (AC) and Single Network Adaptive Critic (SNA-C)

Lecture 22 - Transcription Method to Solve Optimal Control Problems

Lecture 23 - Model Predictive Static Programming (MPSP) and Optimal Guidance of Aerospace Vehicles

Lecture 24 - MPSP for Optimal Missile Guidance

Lecture 25 - Model Predictive Spread Control (MPSC) and Generalized MPSP (G-MPSP) Designs

Lecture 26 - Linear Quadratic Observer & An Overview of State Estimation

Lecture 27 - Review of Probability Theory and Random Variables

Lecture 28 - Kalman Filter Design - I

Lecture 29 - Kalman Filter Design - II

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

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- Lecture 30 - Kalman Filter Design - III
- Lecture 31 - Integrated Estimation, Guidance & Control - I
- Lecture 32 - Integrated Estimation, Guidance & Control - II
- Lecture 33 - LQG Design; Neighboring Optimal Control & Sufficiency Condition
- Lecture 34 - Constrained Optimal Control - I
- Lecture 35 - Constrained Optimal Control - II
- Lecture 36 - Constrained Optimal Control - III
- Lecture 37 - Optimal Control of Distributed Parameter Systems - I
- Lecture 38 - Optimal Control of Distributed Parameter Systems - II
- Lecture 39 - Take Home Material
- Lecture 40 - Take Home Material



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

NPTEL Video Course - Aerospace Engineering - NOC:Combustion in Air Breathing Aero Engines

Subject Co-ordinator - Prof. Swetaprovo Chaudhuri

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction
- Lecture 2 - Chemical Equilibrium - I
- Lecture 3 - Chemical Equilibrium - II
- Lecture 4 - Chemical Kinetics - I
- Lecture 5 - Chemical Kinetics - II
- Lecture 6 - Chemical Kinetics - III
- Lecture 7 - Chemical Kinetics - IV
- Lecture 8 - Oxidation Mechanism of Fuels - I
- Lecture 9 - Oxidation Mechanism of Fuels - II
- Lecture 10 - Oxidation Mechanism of Fuels - III
- Lecture 11 - Oxidation Mechanism of Fuels - IV
- Lecture 12 - Transport Phenomena
- Lecture 13 - Governing Equations - I
- Lecture 14 - Governing Equations - II
- Lecture 15 - Governing Equations - III
- Lecture 16 - Governing Equations - IV
- Lecture 17 - Governing Equations - V
- Lecture 18 - Laminar Non-Premixed Flames - I
- Lecture 19 - Laminar Non-Premixed Flames - II
- Lecture 20 - Laminar Non-Premixed Flames - III
- Lecture 21 - Laminar Non-Premixed Flames - IV
- Lecture 22 - Laminar Premixed Flames - I
- Lecture 23 - Laminar Premixed Flames - II
- Lecture 24 - Laminar Premixed Flames - III
- Lecture 25 - Laminar Premixed Flames - IV
- Lecture 26 - Laminar Premixed Flames - V
- Lecture 27 - Laminar Premixed Flames - VI
- Lecture 28 - Laminar Premixed Flames - VII
- Lecture 29 - Limit Phenomena - I

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

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- Lecture 30 - Limit Phenomena - II
- Lecture 31 - Introduction to turbulent flows
- Lecture 32 - Non-reacting turbulent flows - I
- Lecture 33 - Non-reacting turbulent flows - II
- Lecture 34 - Reacting turbulent flows - III
- Lecture 35 - Reacting turbulent flows - IV
- Lecture 36 - Reacting turbulent flows - V
- Lecture 37 - Reacting turbulent flows - VI
- Lecture 38 - Reacting turbulent flows - VII
- Lecture 39 - Turbulent Non-Premixed Flames - I
- Lecture 40 - Turbulent Non-Premixed Flames - II
- Lecture 41 - Turbulent Non-Premixed Flames - III
- Lecture 42 - Turbulent Premixed Flames - I
- Lecture 43 - Turbulent Premixed Flames - II
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- Lecture 47 - Turbulent Premixed Flames - VI
- Lecture 48 - Aero Gas Turbine Combustors - I
- Lecture 49 - Aero Gas Turbine Combustors - II
- Lecture 50 - Aero Gas Turbine Combustors - III
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- Lecture 53 - Flame Stabilization and Blow off - I
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- Lecture 58 - Combustion in Scramjets - I
- Lecture 59 - Combustion in Scramjets - II
- Lecture 60 - Combustion in Scramjets - III
- Lecture 61 - Combustion in Scramjets - IV
- Lecture 62 - Review

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

NPTEL Video Course - Aerospace Engineering - NOC:Gasdynamics: Fundamentals and Applications

Subject Co-ordinator - Prof. Srisha Rao M V

Co-ordinating Institute - IISc - Bangalore

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

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Lecture 2 - Flow Regimes  
Lecture 3 - Thermodynamics - 1  
Lecture 4 - Thermodynamics - 2  
Lecture 5 - Thermodynamics - Numerical  
Lecture 6 - Flow equations - Integral Form  
Lecture 7 - Flow equations - Differential Form  
Lecture 8 - Quasi-1D Assumption  
Lecture 9 - Speed of Sound  
Lecture 10 - Speed of Sound - Numerical  
Lecture 11 - Stagnation properties  
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Lecture 15 - Normal Shock - I  
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Lecture 21 - The Shock Tube  
Lecture 22 - Waves of infinitesimal Amplitude  
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Lecture 24 - Shock Tube Relations  
Lecture 25 - Unsteady Flows - Numerical  
Lecture 26 - Oblique Shock Waves  
Lecture 27 - Expansion waves  
Lecture 28 - Shock Expansion Method  
Lecture 29 - Shock Reflection

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- Lecture 30 - Oblique Shock and Expansion waves - Numerical
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- Lecture 35 - Varying area flow- Numericals - I
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- Lecture 37 - Experimental facilities
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- Lecture 41 - 1D flow with friction - Fanno flow - I
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- Lecture 45 - 1D Flows with Heat Addition: Rayleigh Flows - I
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- Lecture 52 - Method of Characteristics: 2D Supersonic Flow - I
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