

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

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

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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 - 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  
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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 33  
Lecture 34  
Lecture 35  
Lecture 36  
Lecture 37  
Lecture 38  
Lecture 39  
Lecture 40

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

NPTEL Video Course - 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  
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Lecture 26 - Instability and Transition of Fluid Flows  
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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
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- 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  
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Lecture 22 - Introduction to Helicopter Aerodynamics and Dynamics  
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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  
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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  
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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  
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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  $\alpha_{trim}$   
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 - 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 - 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  
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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 - 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
- Lecture 44 - Turbulent Premixed Flames - III
- Lecture 45 - Turbulent Premixed Flames - IV
- Lecture 46 - Turbulent Premixed Flames - V
- 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
- Lecture 51 - Aero Gas Turbine Combustors - IV
- Lecture 52 - Aero Gas Turbine Combustors - V
- Lecture 53 - Flame Stabilization and Blow off - I
- Lecture 54 - Flame Stabilization and Blow off - II
- Lecture 55 - Flame Stabilization and Blow off - III
- Lecture 56 - Flame Stabilization and Blow off - IV
- Lecture 57 - Flame Stabilization and Blow off - V
- 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