

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

NPTEL Video Course - Atmospheric Science - Introduction to Atmospheric Science

Subject Co-ordinator - Prof. C. Balaji

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction
- Lecture 2 - Atmosphere-A brief survey (Pressure, Temperature and Chemical composition)
- Lecture 3 - Atmosphere-A brief survey (Continued...) (Vertical structure of the atmosphere)
- Lecture 4 - Vertical structure of atmosphere (Continued...) and The Earth system - Oceans
- Lecture 5 - The Earth system - Oceans (Continued...) and Marine biosphere
- Lecture 6 - The Earth system - Hydrological cycle
- Lecture 7 - The Earth system - Hydrological cycle (Continued...) and Carbon cycle
- Lecture 8 - The Earth system - Carbon cycle (Continued...), and Carbon in the oceans Earth's crust
- Lecture 9 - The Earth system - Carbon in the oceans Earth's crust
- Lecture 10 - Atmospheric Thermodynamics- Introduction
- Lecture 11 - The hydrostatic equation
- Lecture 12 - Hypsometric equation and pressure at sea level
- Lecture 13 - Basic Thermodynamics
- Lecture 14 - Concept of air parcel and dry adiabatic lapse rate
- Lecture 15 - Potential temperature
- Lecture 16 - Skew-T ln-P chart
- Lecture 17 - Problems using Skew-T ln-P chart
- Lecture 18 - Problems using Skew-T ln-P chart (Continued...)
- Lecture 19 - Problems using Skew-T ln-P chart (Continued...)
- Lecture 20 - Lifting Condensation Level (LCL)
- Lecture 21 - Lifting Condensation Level (LCL) (Continued...)
- Lecture 22 - Saturated Adiabatic and Pseudo-adiabatic processes
- Lecture 23 - Equivalent potential temperature and wet bulb potential temperature
- Lecture 24 - Normand's rule - Chinook winds
- Lecture 25 - Problems on Chinook wind and static stability
- Lecture 26 - Static stability-Brunt-Visala frequency
- Lecture 27 - Conditional and convective instability
- Lecture 28 - Static stability - Problems using radiosonde data and skew T ln P chart
- Lecture 29 - The second law of thermodynamics  $\hat{a}$  Clausius Clapeyron relation

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- Lecture 30 - Clausius Clapeyron relation (Continued...)
- Lecture 31 - Atmospheric radiation & Radiation laws
- Lecture 32 - Planck's distribution and Inverse square law
- Lecture 33 - Physics of scattering, emission and absorption
- Lecture 34 - Physics of scattering, emission and absorption (Continued...)
- Lecture 35 - Radiative Transfer Equation & Derivation
- Lecture 36 - Radiative Transfer Equation (Continued...)
- Lecture 37 - Radiative heating profiles of the atmosphere
- Lecture 38 - Climate Dynamics & Introduction
- Lecture 39 - Climate sensitivity and feedback
- Lecture 40 - Climate change
- Lecture 41 - Atmospheric dynamics

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

NPTEL Video Course - Atmospheric Science - Radiation Heat Transfer

Subject Co-ordinator - Prof. J. Srinivasan

Co-ordinating Institute - IISc - Bangalore

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

- Lecture 1 - Introduction
- Lecture 2 - Blackbody radiation
- Lecture 3 - Properties of real surfaces
- Lecture 4 - Spectral and directional variations
- Lecture 5 - Shape factor
- Lecture 6 - Triangular enclosure
- Lecture 7 - Evaluation of shape factors
- Lecture 8 - Radiation in enclosures
- Lecture 9 - Electrical analogy
- Lecture 10 - Applications
- Lecture 11 - Non-gray enclosures
- Lecture 12 - Enclosure with Specular surfaces
- Lecture 13 - Integral method for enclosures
- Lecture 14 - Introduction to gas radiation
- Lecture 15 - Plane parallel model
- Lecture 16 - Diffusion approximation
- Lecture 17 - Radiative equilibrium
- Lecture 18 - Optically thick limit
- Lecture 19 - Radiation spectroscopy
- Lecture 20 - Isothermal gas emissivity
- Lecture 21 - Band models
- Lecture 22 - Total Emissivity method
- Lecture 23 - Isothermal gas enclosures
- Lecture 24 - Well-stirred furnace model
- Lecture 25 - Gas radiation in complex enclosures
- Lecture 26 - Interaction between radiation and other modes of heat transfer
- Lecture 27 - Radiation heat transfer during flow over flat plate
- Lecture 28 - Radiation and Climate
- Lecture 29 - Radiative-convective equilibrium

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- Lecture 30 - Radiative equilibrium with scattering
- Lecture 31 - Radiation measurement
- Lecture 32 - Radiation with internal heat source
- Lecture 33 - Particle scattering
- Lecture 34 - Scattering in the atmosphere
- Lecture 35 - Non-isotropic scattering
- Lecture 36 - Approximate methods in scattering
- Lecture 37 - Approximate methods in scattering
- Lecture 38 - Monte Carlo method

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

NPTEL Video Course - Atmospheric Science - The monsoon and its variability

Subject Co-ordinator - Prof. Sulochana Gadgil

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Preamble and Introduction to the Indian Monsoon

Lecture 2 - Nature of the variability of the Indian Monsoon

Lecture 3 - Monsoon variability through the eye in the sky, seasonal variation of the surface wind and pressure

Lecture 4 - Background about the atmosphere and rotating systems

Lecture 5 - Rainfall and clouds over the tropics

Lecture 6 - Organization of clouds over mesoscale, synoptic scale and planetary scales

Lecture 7 - The Indian monsoon

Lecture 8 - Monsoons and the seasonal variation of tropical circulation and rainfall

Lecture 9 - Evolution of the ideas about the basic system responsible for the Indian monsoon - Part 1

Lecture 10 - Evolution of the ideas about the basic system responsible for the Indian monsoon - Part 2

Lecture 11 - Tropical Convergence Zones and the Indian monsoon - Part 1

Lecture 12 - Tropical Convergence Zones and the Indian monsoon - Part 2

Lecture 13 - Variability of organized convection over the tropical oceans

Lecture 14 - Heat lows and the TCZ

Lecture 15 - Monsoonal regions of the world

Lecture 16 - Seasonal transitions - Part 1

Lecture 17 - Seasonal transitions - Part 2

Lecture 18 - Seasonal transitions - Part 3

Lecture 19 - Climatic clusters of the Indian region

Lecture 20 - Active-weak spells and breaks in the monsoon - Part 1

Lecture 21 - Active-weak spells and breaks in the monsoon - Part 2

Lecture 22 - Intraseasonal variation and intraseasonal oscillations

Lecture 23 - The tropical oceans

Lecture 24 - El Nino Southern Oscillation (ENSO) - Part 1

Lecture 25 - El Nino Southern Oscillation (ENSO) - Part 2

Lecture 26 - El Nino Southern Oscillation (ENSO) - Part 3

Lecture 27 - El Nino Southern Oscillation (ENSO) - Part 4

Lecture 28 - El Nino Southern Oscillation (ENSO) - Part 5

Lecture 29 - El Nino Southern Oscillation (ENSO) - Part 6

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- Lecture 30 - Indian Ocean and the monsoon - Part 1
- Lecture 31 - Indian Ocean and the monsoon - Part 2
- Lecture 32 - Indian Ocean Dipole - Part 1
- Lecture 33 - Indian Ocean Dipole - Part 2
- Lecture 34 - Interannual variation of the Indian summer Monsoon rainfall
- Lecture 35 - Monsoon Variability and Agriculture - Part 1
- Lecture 36 - Monsoon Variability and Agriculture - Part 2
- Lecture 37 - Monsoon Variability and Agriculture - Part 3
- Lecture 38 - Monsoon Variability and Agriculture - Part 4
- Lecture 39 - Indian Summer Monsoon, GDP and Agriculture
- Lecture 40 - Monsoon Prediction - Part 1
- Lecture 41 - Monsoon Prediction - Part 2
- Lecture 42 - Concluding Remarks