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 Psuedo-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 â Clausius Clapeyron relation

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Lecture 30 - Clausius Clapeyron relation (Continued...)
Lecture 31 - Atmospheric radiation â 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 â Derivation
Lecture 36 - Radiative Transfer Equation (Continued...)
Lecture 37 - Radiative heating profiles of the atmosphere
Lecture 38 - Climate Dynamics â Introduction
Lecture 39 - Climate sensitivity and feedback
Lecture 40 - Climate change
Lecture 41 - Atmospheric dynamics
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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
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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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