

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

NPTEL Video Course - Mechanical Engineering - Conduction And Radiation

Subject Co-ordinator - Prof. C. Balaji

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Importance of Thermal Radiation

Lecture 2 - Blackbody definition

Lecture 3 - Solid angle, spectral radiation intensity

Lecture 4 - Radiation pressure and radiation energy density

Lecture 5 - Relationship between  $\hat{I}_\lambda \cdot$  and  $\hat{T}_\lambda \cdot$  and Candidate blackbody distribution functions

Lecture 6 - Candidate blackbody distribution functions (Continued...)

Lecture 7 - Planck's blackbody radiation distribution function

Lecture 8 - Planck's distribution and Wien's displacement law

Lecture 9 - Universal blackbody function

Lecture 10 - Emissivity

Lecture 11 - Emissivity (Continued...)

Lecture 12 - Emissivity (Continued...)

Lecture 13 - Kirchoff law, Absorptivity

Lecture 14 - Kirchoff law, Absorptivity (Continued...)

Lecture 15 - Problems on emissivity, absorptivity

Lecture 16 - Reflectivity

Lecture 17 - Transmissivity

Lecture 18 - Problems on reflectivity and transmissivity

Lecture 19 - Radiation heat transfer between surfaces

Lecture 20 - View factor

Lecture 21 - View factor (Continued...)

Lecture 22 - View factor (Continued...)

Lecture 23 - Enclosure analysis

Lecture 24 - Enclosure analysis (Continued...)

Lecture 25 - Enclosure analysis - Gray surface

Lecture 26 - Enclosure analysis - Non gray surfaces

Lecture 27 - Radiation in participating media

Lecture 28 - Solution to the RTE

Lecture 29 - Concept of mean beam length

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- Lecture 30 - Enclosure analysis in the presence of absorbing / emitting gas
- Lecture 31 - Emissivities and absorptivities of Gas mixtures
- Lecture 32 - Conduction - Introduction
- Lecture 33 - Conduction - Energy equation
- Lecture 34 - Conduction - 1D, steady state
- Lecture 35 - Conduction - 1D, heat generation
- Lecture 36 - Fin heat transfer - I
- Lecture 37 - Fin heat transfer - II
- Lecture 38 - Conduction - Cylindrical and Spherical geometries
- Lecture 39 - Transient conduction
- Lecture 40 - Transient conduction (Continued...)
- Lecture 41 - Two dimensional steady state conduction
- Lecture 42 - Analytical solution for Laplace equation
- Lecture 43 - Numerical methods in conduction
- Lecture 44 - Numerical methods in conduction (Continued...)
- Lecture 45 - Conduction with change of phase
- Lecture 46 - Conduction with change of phase (Continued...)