

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

NPTEL Video Course - Metallurgy and Material Science - NOC:Thermodynamics and Kinetics of Materials

Subject Co-ordinator - Prof. Saswata Bhattacharya

Co-ordinating Institute - IIT - Hyderabad

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

- Lecture 1 - Basic Concepts
- Lecture 2 - Energy, Heat and Work I - Part 1
- Lecture 3 - Energy, Heat and Work II - Part 2
- Lecture 4 - Heat capacity and Enthalpy
- Lecture 5 - Heat capacity relations in materials
- Lecture 6 - Introduction to the Second law of Thermodynamics
- Lecture 7 - Clausius inequality and entropy of transformation
- Lecture 8 - First and Second Laws Combined
- Lecture 9 - Third Law, Absolute Zero, and Other Energy Functions
- Lecture 10 - Axiomatic Approach and Thermodynamic Equilibrium in Simple Systems
- Lecture 11 - Formulations of Equilibrium in Thermodynamic Systems
- Lecture 12 - Fundamental relations and alternative formulations of equilibrium criterion
- Lecture 13 - Maxwell relations and their application
- Lecture 14 - Concepts of Statistical Thermodynamics - 1
- Lecture 15 - Concepts of Statistical Thermodynamics - 2
- Lecture 16 - Thermodynamic Equilibrium in Statistical Thermodynamics
- Lecture 17 - Phase equilibria and phase transition in unary systems - 1
- Lecture 18 - Phase equilibria and phase transition in unary systems - 2
- Lecture 19 - Phase equilibria and phase transition in unary systems - 3
- Lecture 20 - Applications of Clausius-Clapeyron Equation
- Lecture 21 - Thermodynamics of solutions - 1
- Lecture 22 - Thermodynamics of solutions - 2
- Lecture 23 - Multicomponent solutions and mixing process
- Lecture 24 - Thermodynamic properties due to mixing
- Lecture 25 - Ideal and Real Solutions
- Lecture 26 - Regular solutions and thermodynamic properties of mixing
- Lecture 27 - Colligative Properties
- Lecture 28 - Quasichemical Approach and regular solutions
- Lecture 29 - Quasichemical solution model for ordered phases - I

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- Lecture 30 - Quasichemical solution model for ordered phases - II
- Lecture 31 - Phase equilibria in multiphase, multicomponent, non-reacting systems
- Lecture 32 - Binary phase diagrams and lever rule
- Lecture 33 - Binary alloy phase diagrams and invariant points
- Lecture 34 - Binary alloy phase diagrams - intermediate phases and miscibility gap
- Lecture 35 - Thermodynamics of phase diagrams - G-x curves
- Lecture 36 - Thermodynamic Stability and Numerical Modeling
- Lecture 37 - Thermodynamics of reacting systems
- Lecture 38 - Elements of thermodynamics of interfaces and thermodynamics of irreversible processes