NPTEL : Convective Heat and Mass Transfer (Mechanical Engineering)

Co-ordinators : Prof. A.W. Date

NPTEL : Cryogenic Engineering (Mechanical Engineering)

Co-ordinators : Prof. M.D. Atrey

Lecture 1 - Introduction to Cryogenic Engineering

Lecture 2 - Properties of Cryogenic Fluids - I

Lecture 3 - Properties of Cryogenic Fluids - II

Lecture 4 - Properties of Cryogenic

Lecture 5 - Material Properties at Low Temperature - I

Lecture 6 - Material Properties at Low Temperature - II

Lecture 7 - Material Properties at Low Temperature - III

Lecture 8 - Gas Liquefaction and Refrigeration Systems - I

Lecture 9 - Gas Liquefaction and Refrigeration Systems - II

Lecture 10 - Gas Liquefaction and Refrigeration Systems - III

Lecture 11 - Gas Liquefaction and Refrigeration Systems - IV

Lecture 12 - Gas Liquefaction and Refrigeration Systems - V

Lecture 13 - Gas Liquefaction and Refrigeration Systems - VI

Lecture 14 - Gas Liquefaction and Refrigeration Systems - VII

Lecture 15 - Gas Liquefaction and Refrigeration Systems - VIII

Lecture 16 - Gas Liquefaction and Refrigeration Systems - IX

Lecture 17 - Gas Liquefaction and Refrigeration Systems - X

Lecture 18 - Gas Separation - I

Lecture 19 - Gas Separation - II

Lecture 20 - Gas Separation - III

Lecture 21 - Gas Separation - IV

Lecture 22 - Gas Separation - V

Lecture 23 - Gas Separation - VI

Lecture 24 - Gas Separation - VII

Lecture 25 - Gas Separation - VIII

Lecture 26 - Cryocoolers

Lecture 27 - Cryocoolers Ideal Stirling Cycle - I

Lecture 28 - Cryocoolers Ideal Stirling Cycle - II

Lecture 29 - Cryocoolers Ideal Stirling Cycle - III

Lecture 30 - Cryocoolers Ideal Stirling Cycle - IV

Lecture 31 - Cryocoolers Ideal Stirling Cycle - V

NPTEL : Advanced Strength of Materials (Mechanical Engineering)

Co-ordinators : Prof. S.K. Maiti

NPTEL : Heat and Mass Transfer (Mechanical Engineering)

Co-ordinators : Prof. S.P. Sukhatme, Prof. U.N. Gaitonde

NPTEL : Robotics (Mechanical Engineering)

Co-ordinators : Prof. P. Seshu, Prof. P.S. Gandhi, Prof. K. Kurien Issac, Prof. B. Seth, Prof. C. Amarnath

NPTEL : NOC:Optimization from Fundamentals (Mechanical Engineering)

Co-ordinators : Prof. Ankur A. Kulkarni

NPTEL : NOC:Design of Mechatronic Systems (Mechanical Engineering)

Co-ordinators : Prof. Prasanna Gandhi

NPTEL : NOC:Nonlinear Adaptive Control (Mechanical Engineering)

Co-ordinators : Prof. Srikant Sukumar

NPTEL : NOC:Nonlinear Control Design (Mechanical Engineering)

Co-ordinators : Prof. Srikant Sukumar

Lecture 1 - Course Introduction

Lecture 2 - Examples of Nonlinear systems

Lecture 3 - Existence and uniqueness of solutions

Lecture 4 - Preliminaries and notations

Lecture 5 - Preliminaries: Normed linear space

Lecture 6 - Preliminaries: Induced Matrix Norms and Signal Norms

Lecture 7 - Signal Norms and Cauchy-Schwarz Inequality

Lecture 8 - Stability - Part 1

Lecture 9 - Stability - Part 2

Lecture 10 - Stability - Part 3

Lecture 11 - Stability - Part 4

Lecture 12 - Stability - Part 5

Lecture 13 - Lyapunov stability Theorems - Part 1

Lecture 14 - Lyapunov stability Theorems - Part 2

Lecture 15 - Lyapunov stability Theorems - Part 3

Lecture 16 - Lyapunov stability Theorems - Part 4

Lecture 17 - Lyapunov stability Theorems - Part 5

Lecture 18 - Lyapunov stability Theorems - Part 6

Lecture 19 - Proofs of Lyapunov Stability Theorems - Part 1

Lecture 20 - Proofs of Lyapunov Stability Theorems - Part 2

Lecture 21 - Proofs of Lyapunov Stability Theorems - Part 3

Lecture 22 - Proofs of Lyapunov Stability Theorems - Part 4

Lecture 23 - La Salle's Invariance Principle - Part 1

Lecture 24 - La Salle's Invariance Principle - Part 2

Lecture 25 - La Salle's Invariance Principle - Part 3

Lecture 26 - La Salle's Invariance Principle - Part 4

Lecture 27 - La Salle's Invariance Principle - Part 5

Lecture 28 - La Salle's Invariance Principle - Part 6

Lecture 29 - Control Lyapunov functions - Part 1

Lecture 30 - Control Lyapunov functions - Part 2

Lecture 31 - Control Lyapunov functions - Part 3

NPTEL : Tribology (Mechanical Engineering)

Co-ordinators : Dr. Harish Hirani

NPTEL : Computer Aided Design and Manufacturing (Mechanical Engineering)

Co-ordinators : Prof. P.V. Madhusudan Rao, Prof. Anoop Chawla

NPTEL : Project and Production Management (Mechanical Engineering)

Co-ordinators : Prof. Arun Kanda

Lecture 32 - Computerised Layout Planning

Lecture 33 - Product Layouts and Assembly Line Balancing

Lecture 34 - Forecasting

Lecture 35 - The Analysis of Time Series

Lecture 36 - Aggregate Production Planning: Basic Concepts

Lecture 37 - Modelling Approaches

Lecture 38 - Basic Inventory Principles

Lecture 39 - Inventory Modelling

Lecture 40 - Material Requirements Planning

Lecture 41 - Scheduling of Job Shops

NPTEL : NOC:RAC Product Design (Mechanical Engineering)

Co-ordinators : Prof. Sanjeev Jain

NPTEL : NOC:Thermodynamics (Mechanical Engineering)

Co-ordinators : Prof. S.R kale

NPTEL : NOC:Solid Mechanics (Mechanical Engineering)

Co-ordinators : Prof. Ajeet Kumar

Lecture 32 - Theories of Failure (Continued...)

NPTEL : NOC:Introduction to Uncertainty Analysis and Experimentation (Mechanical Engineering)

Co-ordinators : Unknown

NPTEL : NOC:Engineering Graphics and Design (Mechanical Engineering)

Co-ordinators : Prof. Naresh Varma Datla and Prof. S.R Kale

NPTEL : NOC:Ideal Fluid Flows using Complex Analysis (Mechanical Engineering)

Co-ordinators : Prof. Amit Gupta

NPTEL : NOC:Experimental Modal Analysis (Mechanical Engineering)

Co-ordinators : Subodh V. Modak

NPTEL : NOC:Mechanical Behavior of Polymers and Composites (Mechanical Engineering)

Co-ordinators : Dr. Naresh V Datla

NPTEL : NOC:Data-Enabled Tribological Engineering: From Experiments to Predictive Models (Mechanical Engineering)

Co-ordinators : Prof. (HAG) Harish Hirani

NPTEL : Nonlinear Vibration (Mechanical Engineering)

Co-ordinators : Prof. S.K. Dwivedy

NPTEL : Theory and Practice of Rotor Dynamics (Mechanical Engineering)

Co-ordinators : Prof. Rajiv Tiwari

NPTEL : Engineering Mechanics (Mechanical Engineering)

Co-ordinators : Prof. U.S. Dixit, Dr. G. Saravana Kumar

NPTEL : Mechanical Vibrations (Mechanical Engineering)

Co-ordinators : Prof. S.K. Dwivedy, Prof. Rajiv Tiwari

NPTEL : NOC:Advanced Machining Processes (Mechanical Engineering)

Co-ordinators : Prof. Manas Das

NPTEL : NOC:Fundamentals of Nuclear Power Generation (Mechanical Engineering)

Co-ordinators : Prof. Dipankar N. Basu

NPTEL : NOC:Advances in Welding and Joining Technologies (Mechanical Engineering)

Co-ordinators : Prof. Swarup bag

NPTEL : NOC:Introduction to Machining and Machining Fluids (Mechanical Engineering)

Co-ordinators : Prof. Mamilla Ravi Sankar

NPTEL : NOC:Mechanics of Machining (Mechanical Engineering)

Co-ordinators : Dr. Uday S. Dixit

NPTEL : NOC:Principle of Hydraulic Machines and System Design (Mechanical Engineering)

Co-ordinators : Prof. Pranab K. Mondal

NPTEL : NOC:Introduction to Abrasive Machining and Finishing Processes (Mechanical Engineering)

Co-ordinators : Prof. Mamilla Ravi Sankar

NPTEL : NOC:Theory of Rectangular Plates - Part 1 (Mechanical Engineering)

Co-ordinators : Prof. Poonam Kumari

NPTEL : NOC:Principles of Mechanical Measurement (Mechanical Engineering)

Co-ordinators : Prof. Dipankar N. Basu

NPTEL : NOC:IC Engines and Gas Turbines (Mechanical Engineering)

Co-ordinators : Dr. Vinayak Kulkarni, Prof. Pranab K. Mondal

NPTEL : NOC:Fundamental of Welding Science and Technology (Mechanical Engineering)

Co-ordinators : Prof. Pankaj Biswas

NPTEL : NOC:Polymer Assisted Abrasive Finishing Processes (Mechanical Engineering)

Co-ordinators : Prof. Mamilla Ravi Sankar

NPTEL : NOC:Mathematical Modeling of Manufacturing Processes (Mechanical Engineering)

Co-ordinators : Prof. Swarup bag

NPTEL : NOC:Two-Phase flow with phase change in Conventional and Miniature Channels (Mechanical Engineering)

Co-ordinators : Prof. Manmohan Pandey

NPTEL : NOC:Applied Thermodynamics for Engineers (Mechanical Engineering)

Co-ordinators : Prof. Dipankar N. Basu

NPTEL : NOC:Fundamentals of Conduction and Radiation (Mechanical Engineering)

Co-ordinators : Prof. Dipankar N. Basu

NPTEL : NOC:Steam Power Engineering (Mechanical Engineering)

Co-ordinators : Dr. Vinayak Kulkarni

NPTEL : NOC:Dynamic Behaviour of Materials (Mechanical Engineering)

Co-ordinators : Prof. Prasenjit Khanikar

NPTEL : NOC:Plastic Working of Metallic Materials (Mechanical Engineering)

Co-ordinators : Prof. P.S. Robi

NPTEL : NOC:Fundamentals of Artificial Intelligence (Mechanical Engineering)

Co-ordinators : Prof. Shyamanta M. Hazarika

NPTEL : NOC:Aircraft Propulsion (Mechanical Engineering)

Co-ordinators : Dr. Vinayak Kulkarni

Lecture 32 - Examples of Axial Flow Compressor

Lecture 33 - Examples of Axial Flow Compressor

Lecture 34 - Axial Turbine: Velocity diagrams, Workdone, and Degree of Reaction

Lecture 35 - Radial Turbine: Velocity diagrams, h-s diagram, Stage effieciency and degree of reaction

Lecture 36 - Examples of Axial Turbine

Lecture 37 - Practice examples of Axial Turbine and cetrifugal compressor

Lecture 38 - Cascade theory and Blade design

Lecture 39 - Cascade variables and Turbine Cascade

Lecture 40 - Velocity diagrams of Turbine Cascade, Compressor cascade

Lecture 41 - Turbine cooling methods

Lecture 42 - Practice examples of aircraft engine

NPTEL : NOC:Computational Fluid Dynamics for Incompressible Flows (Mechanical Engineering)

Co-ordinators : Prof. Amaresh Dalal

NPTEL : NOC:Experimental Methods in Fluid Mechanics (Mechanical Engineering)

Co-ordinators : Prof. Pranab K. Mondal

NPTEL : NOC:Automation in Manufacturing (Mechanical Engineering)

Co-ordinators : Dr. Shrikrishna N. Joshi

NPTEL : NOC:Fundamentals of Compressible Flow (Mechanical Engineering)

Co-ordinators : Prof. Niranjan Sahoo

NPTEL : NOC:Finite Element Method: Variational Methods to Computer Programming (Mechanical Engineering)

Co-ordinators : Prof. Arup Nandy, Prof. Atanu Banerjee

NPTEL : NOC:Computational Continuum Mechanics (Mechanical Engineering)

Co-ordinators : Prof. Sachin Singh Gautam

NPTEL : NOC:Fundamentals of Convective Heat Transfer (Mechanical Engineering)

Co-ordinators : Prof. Amaresh Dalal

NPTEL : NOC:Theory of Composite Shells (Mechanical Engineering)

Co-ordinators : Prof. Poonam Kumari

NPTEL : NOC:Finite Element Modeling of Welding Processes (Mechanical Engineering)

Co-ordinators : Prof. Swarup bag

NPTEL : NOC:Nonlinear Vibration (Mechanical Engineering)

Co-ordinators : Prof. S. K. Dwivedy

Lecture 1 - Introduction to mechanical systems

Lecture 2 - Superposition rule, Commonly used nonlinear equations

Lecture 3 - Equilibrium points: potential function

Lecture 4 - Force and moment based Approach, Lagrange Principle

Lecture 5 - Extended Hamiltonâ€™s principle

Lecture 6 - Use of scaling and book-keeping parameter for ordering

Lecture 7 - Numerical solution, Analytical solutions: Harmonic Balance method

Lecture 8 - Straight forward expansion

Lecture 9 - Lindstd-Poincareâ€™ method

Lecture 10 - Method of Averaging

Lecture 11 - Method of multiple scales

Lecture 12 - Method of generalized Harmonic Balance method

Lecture 13 - Free vibration of undamped and damped SDOF systems with quadratic and cubic nonlinearity

Lecture 14 - Super and sub harmonic resonance conditions

Lecture 15 - Bifurcation analysis of fixed-point response

Lecture 16 - Nonlinear system with hard excitations

Lecture 17 - Super and sub harmonic resonance conditions

Lecture 18 - Bifurcation analysis of fixed-point response

Lecture 19 - Floquet theory, Hill's infinite determinant, Resonance in parametrically excited systems

Lecture 20 - Parametrically excited pneumatic artificial muscle

Lecture 21 - Parametric instability of sandwich plate

Lecture 22 - Analysis of periodic, quasi-periodic and chaotic systems

Lecture 23 - Stability and bifurcation analysis of periodic and quasi-periodic response

Lecture 24 - Analysis of chaotic system

Lecture 25 - Numerical methods for finding roots and solutions of ODE

Lecture 26 - Time response, phase portraits, frequency response

Lecture 27 - Poincare section, FFT, Lyapunov exponent

Lecture 28 - Pasive and active vibration absorber with displacement and acceleration feedback

Lecture 29 - Active vibration absorber with time delay acceleration feedback by HBM

Lecture 30 - Application of Active vibration absorber with combination feedback

Lecture 31 - Cantilever beam with tip mass for principal parametric resonance

NPTEL : NOC:Evolutionary Computation for Single and Multi Objective Optimization (Mechanical Engineering)

Co-ordinators : Prof. Deepak Sharma

NPTEL : NOC:Viscous Fluid Flow (Mechanical Engineering)

Co-ordinators : Prof. Amaresh Dalal

NPTEL : NOC:Welding Application Technology (Mechanical Engineering)

Co-ordinators : Prof. Pankaj Biswas

NPTEL : NOC:Fundamentals of Additive Manufacturing Technologies (Mechanical Engineering)

Co-ordinators : Prof. Sajan Kapil

NPTEL : NOC:Applied Thermodynamics (Mechanical Engineering)

Co-ordinators : Prof. Niranjan Sahoo

NPTEL : NOC:Mechanics of Fiber Reinforced Polymer Composite Structures (Mechanical Engineering)

Co-ordinators : Prof. Debabrata Chakraborty

Lecture 32 - Buckling and Free Vibration

NPTEL : NOC:Laser Based Manufacturing (Mechanical Engineering)

Co-ordinators : Prof. Shrikrishna N. Joshi

NPTEL : NOC:Advanced Thermodynamics and Combustion (Mechanical Engineering)

Co-ordinators : Prof. Niranjan Sahoo

Lecture 32 - Engine Combustion and Pollution

NPTEL : NOC:Thermal Engineering: Basic and Applied (Mechanical Engineering)

Co-ordinators : Prof. Pranab K. Mondal

Lecture 32 - Nozzle efficiency and factors that affect the efficiency

Lecture 33 - Factors that affect the efficiency, problem on flow nozzle

Lecture 34 - Problem on flow nozzle

Lecture 35 - Steam Turbines: types and analysis using velocity triangles

Lecture 36 - Analysis of Impulse Steam Turbine

Lecture 37 - Compounding of Steam Turbine

Lecture 38 - Analysis of Reaction Steam Turbine

Lecture 39 - Problems on Steam Turbine

Lecture 40 - The Role of Condenser in Power Plant

Lecture 41 - Cooling Tower: Types and Analysis

Lecture 42 - Cooling Tower Performance

Lecture 43 - IC Engines, Classification, Different Parts, SI and CI Engines

Lecture 44 - Comparison of 2-stroke and 4-stroke Engines

Lecture 45 - Comparison of SI and CI Engines, Compression Ratio

Lecture 46 - Introduction to Carburettor and Regimes of Engine Operation

Lecture 47 - Regimes of Engine Operation and Simple Float Type Carburettor

Lecture 48 - Simple Float Type Carburettor and its Analysis

Lecture 49 - Mass Flow Rate of Fuel and limitations of Simple Float Type Carburettor

Lecture 50 - Limitations of Simple Float Type Carburettor, Problem on Carburettion

Lecture 51 - Engine Operating Characteristics: MEP and Indicator diagram

Lecture 52 - Performance Analysis parameters of IC Engine

Lecture 53 - Fuel of IC Engines

Lecture 54 - Alternative Fuels and Self Ignition Characteristics of Fuel: Octane Numner, Cetane Number

Lecture 55 - Thermodynamic Analysis of SI Engine

Lecture 56 - Thermodynamic Analysis of CI Engine

Lecture 57 - Numerical Problems on Engine Performance

Lecture 58 - Pressure-Crank angle diagram, Engine Efficiencies

Lecture 59 - Numerical Problems on SI and CI Engines

Lecture 60 - Vapour Compression Refrigeration Cycle and its analysis

Lecture 61 - Problems on Vapour Compression Refrigeration Cycle

Lecture 62 - Gas Turbine Units and Thermodynamic Cycles

Lecture 63 - Gas Compressor and Optimum Pressure Ratio

Lecture 64 - Compressor Efficiency and Multistage Compression with Intercooling

NPTEL : NOC:Mechanics of Sheet Metal Forming (Mechanical Engineering)

Co-ordinators : Prof. R Ganesh Narayanan

NPTEL : NOC:Power Plant System Engineering (Mechanical Engineering)

Co-ordinators : Prof. Niranjan Sahoo

NPTEL : NOC:Introduction to Solidification Processing (Mechanical Engineering)

Co-ordinators : Prof. Swarup Bag

NPTEL : Acoustics (Mechanical Engineering)

Co-ordinators : Prof. Nachiketa Tiwari

NPTEL : Advanced Machining Processes (Mechanical Engineering)

Co-ordinators : Prof. Vijay K. Jain

NPTEL : Biomicroelectromechanical systems (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

NPTEL : Computer Aided Engineering Design (Mechanical Engineering)

Co-ordinators : Dr. Anupam Saxena

NPTEL : Mathematical Methods in Engineering and Science (Mechanical Engineering)

Co-ordinators : Dr. Bhaskar Dasgupta

NPTEL : Dynamics of Machines (Mechanical Engineering)

Co-ordinators : Prof. Amitabha Ghosh

NPTEL : Finite Element Method (Mechanical Engineering)

Co-ordinators : Prof. C.S. Upadhyay

NPTEL : Kinematics of Machines (Mechanical Engineering)

Co-ordinators : Prof. Ashok K Mallik

NPTEL : Advanced manufacturing process for micro sytem fabrication (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

NPTEL : Engineering Drawing (Dr. Anupam Saxena) (Mechanical Engineering)

Co-ordinators : Dr. Anupam Saxena

NPTEL : NOC:BioMEMS and Microsystems (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

Lecture 1 - Lecture 1

Lecture 2 - Lecture 2

Lecture 3 - Lecture 3

Lecture 4 - Review Lecture 1,2,3

Lecture 5 - Lecture 4

Lecture 6 - Lecture 5

Lecture 7 - Lecture 6

Lecture 8 - Review Lecture 4,5,6

Lecture 9 - Lecture 7

Lecture 10 - Lecture 8

Lecture 11 - Lecture 9-10

Lecture 12 - Lecture-11

Lecture 13 - Lecture-12

Lecture 14 - Lecture-13

Lecture 15 - Lecture-14

Lecture 16 - Lecture-15

Lecture 17 - Lecture-16

Lecture 18 - Lecture-17

Lecture 19 - Lecture-18

Lecture 20 - Lecture-19

Lecture 21 - Review Lecture 7 to 10

Lecture 22 - Review Lecture 11 to 13

Lecture 23 - Review Lecture 14 to 16

Lecture 24 - Lecture-20

Lecture 25 - Lecture-21

Lecture 26 - Lecture-22

Lecture 27 - Lecture-23

Lecture 28 - Lecture-24

Lecture 29 - Lecture-25

Lecture 30 - Review Lecture 17,18,19

Lecture 31 - Review Lecture 20,21,22

NPTEL : NOC:Manufacturing Systems Technology (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

NPTEL : NOC:Manufacturing Systems Technology - Part II (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

NPTEL : NOC:Basics of Finite Element Analysis (Mechanical Engineering)

Co-ordinators : Prof. Nachiketa Tiwari

NPTEL : NOC:Basics of Noise and Its Measurements (Mechanical Engineering)

Co-ordinators : Prof. Nachiketa Tiwari

NPTEL : NOC:Manufacturing Process Technology - Part I (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

NPTEL : NOC:Nature and Property of Materials (Mechanical Engineering)

Co-ordinators : Prof. Bishakh Bhattacharya

NPTEL : NOC:Manufacturing Process Technology - Part II (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

NPTEL : NOC:Basics of Finite Element Analysis - II (Mechanical Engineering)

Co-ordinators : Prof. Nachiketa Tiwari

NPTEL : NOC:Principles of Vibration Control (Mechanical Engineering)

Co-ordinators : Prof. Bishakh Bhattacharya

Lecture 1 - Introduction to Vibration control

Lecture 2 - Strategies and Steps in Vibration Control

Lecture 3 - Strategies, Active control, Detuning and Decoupling

Lecture 4 - Viscous damping model

Lecture 5 - Coulomb and Hysteretic damping model

Lecture 6 - Energy Dissipation in Structural Materials

Lecture 7 - Material Selection Criterion against Damping

Lecture 8 - Design for Enhanced Material Damping

Lecture 9 - Linear Viscoelastic Materials and Models

Lecture 10 - Maxwell and 3-Parameter Models

Lecture 11 - Complex modulus and Applications of VEM

Lecture 12 - Basics of Dynamic Vibration Absorber

Lecture 13 - Modelling of Dynamic Vibration Absorber

Lecture 14 - Proof mass Actuator

Lecture 15 - Springs for Vibration Isolation

Lecture 16 - Introduction to Active Vibration Control

Lecture 17 - Basics of Classical Control System

Lecture 18 - Basics of State Space Control

Lecture 19 - Controllability and Observability of System

Lecture 20 - Full State Feedback Control

Lecture 21 - SMSS Laboratory Demonstration

NPTEL : NOC:Fundamentals of Acoustics (Mechanical Engineering)

Co-ordinators : Prof. Nachiketa Tiwari

NPTEL : NOC:Heat Treatment and Surface Hardening - II (Mechanical Engineering)

Co-ordinators : Dr. Kallol Mondal

Lecture 1 - Recap - I

Lecture 2 - Recap - II

Lecture 3 - Recap - III

Lecture 4 - Determination of Phase Diagram (Experimentally) - I

Lecture 5 - Determination of Phase Diagram (Experimentally) - II

Lecture 6 - Determination of Phase Diagram (Thermodynamically)

Lecture 7 - Effect of pressure on phase transformation temperature and concept of equilibrium between condensed and vapor phase

Lecture 8 - Effect of different parameters on heat treatment and concept of saturation vapor pressure with examples

Lecture 9 - Title: Formation of ideal solid or liquid solution and (G-X) diagrams for ideal solutions (Part-I)

Lecture 10 - G-X diagrams (Part- II) and concept of chemical potential (Micro Sign) from G-X diagrams.

Lecture 11 - Concept of common tangent for equilibrium between two phases

Lecture 12 - Expressions for equilibrium of two phases - I

Lecture 13 - Expressions for equilibrium of two phases - II

Lecture 14 - Expressions for equilibrium of two phases - III

Lecture 15 - Determining nucleation of phases using G-X plot

Lecture 16 - Î”G for nucleation and overall transformation, concepts of solid state transformation including precipitation and Quasi-Chemical Model (QCM)

Lecture 17 - Introduction to real solutions and expression of Î”Hmix based on the Quasi-Chemical Model (QCM)

Lecture 18 - Expression for Î”Hmix as a function of interaction energy and mole fraction, based on the QCM - Part I

Lecture 19 - Expression for Î”Hmix as a function of interaction energy and mole fraction, based on the QCM - Part II

Lecture 20 - Graphical representation of Î”Gmix, Î”Hmix, and -TÎ”Smix for real solutions and evolution of eutectic phase diagram from the G-X plots

Lecture 21 - Effect of Î”Hmix on determination of phase diagrams (same crystal structure)

Lecture 22 - Effect of Î”Hmix on determination of phase diagrams (Continued...)

Lecture 23 - Importance of phase diagrams

Lecture 24 - Effect of heat treatment on microstructure evolution in steel - I

Lecture 25 - Effect of heat treatment on microstructure evolution in steel - II

Lecture 26 - Recap of homogeneous and heterogeneous nucleation for solid to solid transformation

Lecture 27 - Nucleation rate and its dependence on T (temp. of interest), Î”T, Î”G v and Î”G* and, introduction to growth kinetics

Lecture 28 - Growth kinetics (Continued...)

Lecture 29 - Growth rate variation with undercooling and kinetics of overall phase transformation

Lecture 30 - Implication of Avramiâ€™s equation with example on excel spreadsheet

NPTEL : NOC:Phase Transformation in Materials (Mechanical Engineering)

Co-ordinators : Dr. Krishanu Biswas

NPTEL : NOC:Manufacturing of Composites (Mechanical Engineering)

Co-ordinators : Prof. J. Ramkumar

NPTEL : NOC:Applied Ergonomics (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

NPTEL : NOC:Sustainability through Green Manufacturing Systems - An Applied Approach (Mechanical Engineering)

Co-ordinators : Dr. Deepu Philip, Dr. Amandeep Singh

NPTEL : NOC:Noise Management and Control (Mechanical Engineering)

Co-ordinators : Prof. Nachiketa Tiwari

Lecture 32 - Interference of 1-D spherically propagating sound waves - II

Lecture 33 - Noise sources and introduction to microphones

Lecture 34 - Classification of microphones - I

Lecture 35 - Classification of microphones - II

Lecture 36 - Classification of microphones - III

Lecture 37 - Microphone Parameters

Lecture 38 - Understanding microphone specifications

Lecture 39 - Noise Source: Terminology

Lecture 40 - Noise Source: Sound Attenuation

Lecture 41 - Noise Source: Sound Pressure Level due to a noise source located outdoors

Lecture 42 - Noise Source: Role of reflecting surfaces

Lecture 43 - Noise Source: Sound Pressure Level due to a noise source located indoors - Part I

Lecture 44 - Noise Source: Sound Pressure Level due to a noise source located indoors - Part II

Lecture 45 - Measuring Sound Power Level - Understanding standard octave bands

Lecture 46 - Measuring Sound Power Level - Fan noise - Part I

Lecture 47 - Measuring Sound Power Level - Fan noise - Part II

Lecture 48 - Measuring Sound Power Level - Fan noise - Part III

Lecture 49 - Weighting

Lecture 50 - Noise coming from Motors

Lecture 51 - Noise coming from Motors and Pumps

Lecture 52 - Noise coming from Pump and Motor Working Simultaneously

Lecture 53 - Noise coming from Compressors

Lecture 54 - Example problems regarding Noise coming from Compressor

Lecture 55 - Noise Spread Mechanisms

Lecture 56 - Reverberation time

Lecture 57 - Reverberation time example problem

Lecture 58 - Noise from Adjacent Room

Lecture 59 - Acoustic Enclosures

Lecture 60 - Acoustic Enclosures - Example Problems

Lecture 61 - Large acoustical enclosures - I

Lecture 62 - Large acoustical enclosures - II

Lecture 63 - Acoustic barriers - I

Lecture 64 - Acoustic barriers - II

NPTEL : NOC:Design Practice (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

Lecture 32 - Failure Mode Effect Analysis

NPTEL : NOC:Introduction to Composites (Mechanical Engineering)

Co-ordinators : Prof. Nachiketa Tiwari

NPTEL : NOC:Product Design and Manufacturing (Mechanical Engineering)

Co-ordinators : Dr. Amandeep Singh, Prof. J. Ramkumar

Lecture 32 - Creativity techniques - Part 1

Lecture 33 - Creativity techniques - Part 2

Lecture 34 - Frugal Innovation

Lecture 35 - Rapid Prototyping, an introduction

Lecture 36 - Rapid Prototyping Modelling

Lecture 37 - Rapid Prototyping Processes - Part 1

Lecture 38 - Rapid Prototyping Processes - Part 2

Lecture 39 - Laboratory demonstration; 3D printing - Part 1

Lecture 40 - Laboratory demonstration; 3D printing - Part 2

Lecture 41 - Laboratory demonstration; 3D printing - Part 3

Lecture 42 - Plant Layout Planning - Part 1

Lecture 43 - Plant Layout Planning - Part 2

Lecture 44 - Laboratory demonstration; Plant Simulation - Part 1

Lecture 45 - Laboratory demonstration; Plant Simulation - Part 2

Lecture 46 - Laboratory demonstration; Plant Simulation - Part 3

Lecture 47 - Computer Integrated Manufacturing - Part 1

Lecture 48 - Computer Integrated Manufacturing - Part 2

Lecture 49 - Reverse Engineering

Lecture 50 - Managing Competitiveness

NPTEL : NOC:Phase Equilibria in Materials - Nature and Properties of Materials-II (Mechanical Engineering)

Co-ordinators : Dr. Ashish Garg

NPTEL : NOC:Advanced Composites (Mechanical Engineering)

Co-ordinators : Prof. Nachiketa Tiwari

NPTEL : NOC:Engineering Metrology (Mechanical Engineering)

Co-ordinators : Dr. Amandeep Singh, Prof. J. Ramkumar

NPTEL : NOC:Smart Materials and Intelligent System Design (Mechanical Engineering)

Co-ordinators : Prof. Bisakh Bhattacharya

NPTEL : NOC:Design Practice-II (Mechanical Engineering)

Co-ordinators : Dr. Shantanu Bhattacharya

NPTEL : NOC:Rapid Manufacturing (Mechanical Engineering)

Co-ordinators : Prof. J. Ramkumar

NPTEL : NOC:Turbulent Combustion: Theory and Modelling (Mechanical Engineering)

Co-ordinators : Prof. Ashoke De

NPTEL : NOC:Manufacturing Automation (Mechanical Engineering)

Co-ordinators : Prof. Sounak Kumar Choudhury

NPTEL : NOC:Computer Integrated Manufacturing (Mechanical Engineering)

Co-ordinators : Prof. J. Ramkumar, Prof. Amandeep Singh

Lecture 32 - Robotics

Lecture 33 - Programmable Logic Controller

Lecture 34 - Automatic Identification and Data Capture

Lecture 35 - Computer Aided Quality Control - Part 1

Lecture 36 - Computer Aided Quality Control - Part 2

Lecture 37 - Laboratory Demonstration, Coordinate Measuring Machine

Lecture 38 - Rapid Manufacturing - Part 1

Lecture 39 - Rapid Manufacturing - Part 2

Lecture 40 - Laboratory demonstration, Rapid Manufacturing - Part 1

Lecture 41 - Laboratory demonstration, Rapid Manufacturing - Part 2

Lecture 42 - Laboratory Demonstration, CAD using Fusion 360, an introduction

Lecture 43 - Laboratory Demonstration, CAD using Fusion 360, Rendering and 3D printing

Lecture 44 - Material Handling

Lecture 45 - Laboratory Demonstration, Plant Simulation software - Part 1

Lecture 46 - Laboratory Demonstration, Plant Simulation software - Part 2

Lecture 47 - Laboratory Demonstration, Plant Simulation software - Part 3

Lecture 48 - Computers in Manufacturing Industry, current scenario - Part 1

Lecture 49 - Computers in Manufacturing Industry, current scenario - Part 2

Lecture 50 - Computers in Manufacturing Industry, current scenario - Part 3

NPTEL : NOC:Machining Science (Mechanical Engineering)

Co-ordinators : Prof. Sounak Kumar Choudhury

NPTEL : NOC:Foundations of Cognitive Robotics (Mechanical Engineering)

Co-ordinators : Prof. Bishakh Bhattacharya

NPTEL : NOC:Introduction to Robotics (Mechanical Engineering)

Co-ordinators : Prof. Ashish Dutta

NPTEL : NOC:Muffler Acoustics - Application to Automotive Exhaust Noise Control (Mechanical Engineering)

Co-ordinators : Prof. Akhilesh Mimani

NPTEL : NOC:Elements of Solar Energy Conversion (Mechanical Engineering)

Co-ordinators : Prof. Jishnu Bhattacharya

NPTEL : NOC:Manufacturing Processes - Casting and Joining (Mechanical Engineering)

Co-ordinators : Prof. Sounak Kumar Choudhury

NPTEL : NOC:Computational Fluid Dynamics and Heat Transfer (Mechanical Engineering)

Co-ordinators : Prof. Gautam Biswas

NPTEL : NOC:Production Technology: Theory and Practice (Mechanical Engineering)

Co-ordinators : Prof. Sounak Kumar Choudhury

NPTEL : NOC:Introduction to Turbomachinery (Mechanical Engineering)

Co-ordinators : Prof. Subrata Sarkar

NPTEL : NOC:Robot Motion Planning (Mechanical Engineering)

Co-ordinators : Prof. Ashish Dutta

NPTEL : NOC:Metal Additive Manufacturing (Mechanical Engineering)

Co-ordinators : Prof. Amandeep Singh Oberoi, Prof. Janakranjan Ramkumar

Lecture 32 - Reverse Engineering in MAM - Laboratory Demonstration - I

Lecture 33 - Reverse Engineering in MAM - Laboratory Demonstration - II

Lecture 34 - CAD and Topology Optimization Laboratory Demonstration - I

Lecture 35 - CAD and Topology Optimization Laboratory Demonstration - II

Lecture 36 - Non-Destructive Testing - Part 1

Lecture 37 - Non-Destructive Testing - Part 2

Lecture 38 - Sustainability in MAM - Part 1

Lecture 39 - Sustainability in MAM - Part 2

Lecture 40 - Sustainability in MAM - Part 3

Lecture 41 - Metal 3D Printing Laboratory Demonstration - I

Lecture 42 - Metal 3D Printing Laboratory Demonstration - II

Lecture 43 - Safety in MAM

Lecture 44 - Costing in MAM - Part 1

Lecture 45 - Costing in MAM - Part 2

Lecture 46 - Costing in MAM - Part 3

Lecture 47 - Industry 4.0 and MAM

NPTEL : NOC:Conduction and Convection: Fundamentals and Applications (Mechanical Engineering)

Co-ordinators : Prof. Gautam Biswas

NPTEL : NOC:Advanced Robotics (Mechanical Engineering)

Co-ordinators : Prof. Ashish Dutta

NPTEL : NOC:Applied Numerical Methods (Mechanical Engineering)

Co-ordinators : Prof. Malay K. Das

Lecture 65

Lecture 66

Lecture 67

Lecture 68

Lecture 69

Lecture 70

Lecture 71

Lecture 72

Lecture 73

Lecture 74

Lecture 75

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Lecture 89

Lecture 90

Lecture 91

Lecture 92

Lecture 93

Lecture 94

Lecture 95

Lecture 96

Lecture 97

NPTEL : NOC:Social Innovation in Industry 4.0 (Mechanical Engineering)

Co-ordinators : Prof. Janakranjan Ramkumar, Prof. Amandeep Singh Oberoi

NPTEL : NOC:Engineering Thermodynamics in Hindi (Mechanical Engineering)

Co-ordinators : Prof. Jayant K. Singh

NPTEL : NOC:Advanced Machining Processes (2024) (Mechanical Engineering)

Co-ordinators : Prof. Shantanu Bhattacharya

NPTEL : Computational Fluid Dynamics (Prof. S. Chakraborty) (Mechanical Engineering)

Co-ordinators : Prof. S. Chakraborty

NPTEL : Fundamentals of Industrial Oil Hydraulics and Pneumatics (Mechanical Engineering)

Co-ordinators : Prof. R.N. Maiti

NPTEL : Machinery fault diagnosis and signal processing (Mechanical Engineering)

Co-ordinators : Prof. A.R. Mohanty

NPTEL : Solar Energy Technology (Mechanical Engineering)

Co-ordinators : Prof. V.V. Satyamurty

NPTEL : Technology of Surface Coating (Mechanical Engineering)

Co-ordinators : Prof. A.K. Chattopadhyay

NPTEL : Vibration of Structures (Mechanical Engineering)

Co-ordinators : Prof. A. Dasgupta

NPTEL : Basic Thermodynamics (Mechanical Engineering)

Co-ordinators : Prof. S.K. Som

Lecture 32 - Thermodynamics of Multi Component System - III

NPTEL : Design of Machine Elements I (Mechanical Engineering)

Co-ordinators : Prof. G. Chakraborty, Prof. B. Maiti, Prof. S.K. Roychowdhury

NPTEL : Manufacturing Processes II (Mechanical Engineering)

Co-ordinators : Prof. S. Paul, Prof. A.B. Chattopadhyay, Prof. A.K. Chattopadhyay

Lecture 32 - Production of Screw Threads

Lecture 33 - Gear Manufacturing

Lecture 34 - Jigs and Fixtures For Machine Shops

Lecture 35 - Design and Applications of Jigs and Fixtures

Lecture 36 - Non Traditional Manufacturing

Lecture 37 - Ultrasonic Machining

Lecture 38 - Water Jet Machining and Abrasive Water Jet

Lecture 39 - Electro - Chemical Machining

Lecture 40 - Electro - Discharge Machining

Lecture 41 - EBM and LBM

NPTEL : Refrigeration and Air Conditioning (Mechanical Engineering)

Co-ordinators : Prof. M. Ramgopal, Prof. R.C. Arora

NPTEL : Fluid Mechanics (Mechanical Engineering)

Co-ordinators : Prof. S.K. Som

NPTEL : Introduction to Fluid Machines and Compressible Flow (Mechanical Engineering)

Co-ordinators : Prof. S.K. Som

NPTEL : Introduction to Fluid Mechanics and Fluid Engineering (Mechanical Engineering)

Co-ordinators : Prof. S. Chakraborty

NPTEL : Micro fluidics (Mechanical Engineering)

Co-ordinators : Prof. S. Chakraborty

NPTEL : NOC:Conduction and Convection Heat Transfer (Mechanical Engineering)

Co-ordinators : Prof. S.K. Som, Prof. S. Chakraborty

NPTEL : NOC:Vibrations of Structures (Mechanical Engineering)

Co-ordinators : Prof. A. Dasgupta

NPTEL : NOC:Fluid Machines (Mechanical Engineering)

Co-ordinators : Prof. S.K. Som

NPTEL : NOC:Computer numerical control (CNC) of machine tools and processes (Mechanical Engineering)

Co-ordinators : Prof. Asimava Roy Choudhury

NPTEL : NOC:Non Traditional Abrasive Machining Processes - Ultrasonic, Abrasive Jet and Abrasive Water Jet Machining (Mechanical Engineering)

Co-ordinators : Prof. Asimava Roy Choudhury

NPTEL : NOC:Introduction to Fluid Mechanics (Mechanical Engineering)

Co-ordinators : Dr. Suman Chakraborty

Lecture 32 - Bernoulliâ€™s equation - Part I

Lecture 33 - Bernoulliâ€™s equation - Part II

Lecture 34 - Bernoulliâ€™s equation - Part III

Lecture 35 - Eulerâ€™s equation in streamline coordinates

Lecture 36 - Flow over a fat plate: Blasius equation

Lecture 37 - Momentum integral method for boundary layer analysis

Lecture 38 - Approximate solution of the momentum integral equation

Lecture 39 - Displacement and Momentum thickness

Lecture 40 - Illustrative examples

Lecture 41 - Boundary layer separation

Lecture 42 - Resultant force on a body immersed in a fluid under motion

Lecture 43 - Potential flow

Lecture 44 - Examples of Potential flow

Lecture 45 - Some more examples of Potential flows, Lift and Drag force

Lecture 46 - Applications of lift and drag force

Lecture 47 - Some examples of flow past immersed bodies

Lecture 48 - Sports Ball aerodynamics

Lecture 49 - Introduction to compressible flows

Lecture 50 - Significance of Mach number

Lecture 51 - Navier-Stokes equation - Part I

Lecture 52 - Navier-Stokes equation - Part II

Lecture 53 - Navier-Stokes equation - Part III

Lecture 54 - Navier-Stokes equation - Part IV

Lecture 55 - Pipe Flow - Part I

Lecture 56 - Pipe Flow - Part II

Lecture 57 - Pipe Flow - Part III

Lecture 58 - Pipe Flow - Part IV

Lecture 59 - Principle of Similarity and Dynamical Analysis - Part I

Lecture 60 - Principle of Similarity and Dynamical Analysis - Part II

NPTEL : NOC:Spur and Helical Gear Cutting (Mechanical Engineering)

Co-ordinators : Prof. Asimava Roy Choudhury

NPTEL : NOC:Laws of Thermodynamics (Mechanical Engineering)

Co-ordinators : Prof. Suman Chakraborty, Prof. S.K. Som

NPTEL : NOC:Energy Conservation and Waste Heat Recovery (Mechanical Engineering)

Co-ordinators : Prof. PK Das

Lecture 32

Lecture 33

Lecture 34

Lecture 35

Lecture 36

Lecture 37 - Heat Pipe - Part I

Lecture 38 - Heat Pipe - Part II

Lecture 39 - Heat Pipe - Part III

Lecture 40 - Direct Conversion - Introduction to TEG

Lecture 41 - Thermoelectric Generators - Functioning and Applications

Lecture 42 - TEG - performance analysis

Lecture 43 - TEG - performance optimization

Lecture 44 - Direct Conversion - Magneto Hydro dynamics (MHD)

Lecture 45 - Direct Conversion - Thermo-Ionic generation

Lecture 46 - Direct Conversion - Thermo Photo Voltaic generation (TPV)

Lecture 47 - Heat Pumps - I

Lecture 48 - Heat Pumps - II

Lecture 49 - Heat Pumps - III

Lecture 50 - Waste Heat Recovery from Incinerator Plants

Lecture 51 - Energy Storage Systems - I

Lecture 52 - Energy Storage Systems - II

Lecture 53 - Energy Storage Systems - III

Lecture 54 - Energy Storage Systems - IV

Lecture 55 - Energy Storage Systems - V

Lecture 56 - Energy Storage Systems - VI

Lecture 57

Lecture 58

Lecture 59

Lecture 60

Lecture 61

Lecture 62

Lecture 63

Lecture 64

NPTEL : NOC:Introduction to Mechanical Micro Machining (Mechanical Engineering)

Co-ordinators : Prof. Ajay M Sidpara

NPTEL : NOC:Machinery Fault Diagnosis and Signal Processing (Mechanical Engineering)

Co-ordinators : Prof. Amiya Ranjan Mohanty

NPTEL : NOC:Metal Cutting and Machine Tools (Mechanical Engineering)

Co-ordinators : Prof. Asimava Roy Choudhury

NPTEL : NOC:Gear and Gear Unit Design - Theory and Practice (Mechanical Engineering)

Co-ordinators : Prof. Rathindranath Maiti

NPTEL : NOC:Traditional and Non-Traditional Optimization Tools (Mechanical Engineering)

Co-ordinators : Prof. Dilip Kumar Pratihar

NPTEL : NOC:Mechanism and Robot Kinematics (Mechanical Engineering)

Co-ordinators : Dr. Anirvan Das Gupta

NPTEL : NOC:Heat Exchangers: Fundamentals and Design Analysis (Mechanical Engineering)

Co-ordinators : Prof. Prasanta Kr Das, Prof. Somnath Roy

NPTEL : NOC:Robotics (Mechanical Engineering)

Co-ordinators : Prof. Dilip Kumar Pratihar

NPTEL : NOC:Computational Fluid Dynamics (Mechanical Engineering)

Co-ordinators : Prof. S. Chakraborty

NPTEL : NOC:Concepts of Thermodynamics (Mechanical Engineering)

Co-ordinators : Prof. Aditya Bandopadhyay, Prof. Suman Chakraborty

Lecture 32 - Supplementary Lecture : Problem Solving with the Aid of a Computer

Lecture 33 - Introduction to Second Law of Thermodynamics

Lecture 34 - Statements of the Second Law of Thermodynamics

Lecture 35 - Perpetual Motion Machines; Reversible and Irreversible Processes

Lecture 36 - Factors for Irreversibility and Introduction to Reversible Cycles

Lecture 37 - Carnot Theorem and Absolute Temperature Scale

Lecture 38 - Second Law: Illustrative Problems

Lecture 39 - Clausius Inequality and Introduction to Entropy

Lecture 40 - Thermodynamic Property Relationships; Entropy change for Solids, Liquids and Ideal gases

Lecture 41 - Entropy balance for Reversible and Irreversible Processes

Lecture 42 - What is Entropy ?

Lecture 43 - Entropy Change in closed system: Examples

Lecture 44 - Entropy Change in closed system: Examples

Lecture 45 - Supplementary Lecture: Problem solving with the aid of a computer

Lecture 46 - Supplementary Lecture: Problem solving with the aid of a computer

Lecture 47 - Entropy Transport for a flow process

Lecture 48 - Entropy Transport for flow process: Examples

Lecture 49 - Entropy Transport for flow process: Examples

Lecture 50 - Entropy Transport for flow process: Examples

Lecture 51 - Entropy Transport for flow process: Examples

Lecture 52 - Supplementary Lecture: Problem solving with the aid of a computer

Lecture 53 - Exergy (Availability)

Lecture 54 - Exergy (Availability) (Continued...)

Lecture 55 - Exergy Analysis : Examples

Lecture 56 - Exergy Analysis : Examples (Continued...)

Lecture 57 - Thermodynamic Relationships

Lecture 58 - Thermodynamic Relationships (Continued...)

Lecture 59 - Otto Cycle

Lecture 60 - Diesel Cycle

Lecture 61 - Example Problems : Otto Cycle and Diesel Cycle

Lecture 62 - Brayton Cycle

Lecture 63 - Carnot Cycle and Rankine Cycle

Lecture 64 - Carnot Cycle and Rankine Cycle (Continued...)

NPTEL : NOC:Electronic Packaging and Manufacturing (Mechanical Engineering)

Co-ordinators : Prof. A Bhattacharya

NPTEL : NOC:Kinematics of Mechanisms and Machines (Mechanical Engineering)

Co-ordinators : Prof. A. Dasgupta

NPTEL : NOC:Introduction to Fluid Mechanics (2019) (Mechanical Engineering)

Co-ordinators : Prof. Suman Chakraborty

NPTEL : NOC:Conduction and Convection Heat Transfer (Prof. S. Chakraborty) (Mechanical Engineering)

Co-ordinators : Prof. S. Chakraborty

Lecture 65 - Problems on Heat Exchangers

NPTEL : NOC:Advanced Concepts in Fluid Mechanics (Mechanical Engineering)

Co-ordinators : Prof. Aditya Bandopadhyay

NPTEL : NOC:High Performance Computing for Scientists and Engineers (Mechanical Engineering)

Co-ordinators : Prof. Somnath Roy

NPTEL : NOC:Engineering Drawing and Computer Graphics (Mechanical Engineering)

Co-ordinators : Prof. Rajaram Lakkaraju

Lecture 65 - Assembly Drawing (Continued...)

NPTEL : NOC:Tools in Scientific Computing (Mechanical Engineering)

Co-ordinators : Prof. Aditya Bandopadhyay

NPTEL : NOC:Advanced Dynamics (Mechanical Engineering)

Co-ordinators : Prof. Anirvan DasGupta

NPTEL : NOC:Biomechanics of Joints and Orthopaedic Implants (Mechanical Engineering)

Co-ordinators : Prof. Sanjay Gupta

NPTEL : NOC:Elements of Metal Cutting, Machine tools, Gear Cutting and CNC Machining (Mechanical Engineering)

Co-ordinators : Prof. Asimava Roy Choudhury

Lecture 32 - Gear Shaping - II

Lecture 33 - Gear Shaping - III

Lecture 34 - Gear Shaping - IV

Lecture 35 - Gear Hobbing - I

Lecture 36 - Gear Hobbing - II

Lecture 37 - Gear Hobbing - III

Lecture 38 - Gear Hobbing - IV

Lecture 39 - Gear Hobbing - V

Lecture 40 - Gear Hobbing - VI

Lecture 41 - Introduction to computer control role of computers in automation

Lecture 42 - Introduction (Continued...) binary logic and logic gates

Lecture 43 - Classification of Computer numerical control (CNC) Point to point and continuous control

Lecture 44 - Classification (Continued...) : Closed loop and open loop control

Lecture 45 - Tutorial involving simple calculations on different aspects of CNC controls

Lecture 46 - Questions, MCQ Discussions on Motors, Encoders, Decoders and Programming Practice

Lecture 47 - Stepper motors, Permanent magnet DC motors

Lecture 48 - Binary circuits and decoders

Lecture 49 - Tachogenerator, printed circuit motors, Encoders

Lecture 50 - Programming Practice - I

Lecture 51 - Programming Practice - 1I

Lecture 52 - Computer Aided Offline Programming

Lecture 53 - Interpolators - Linear

Lecture 54 - Interpolators - Curvilinear

Lecture 55 - Questions on Programming and Interpolation

Lecture 56 - 3-D Machining - Basic Concepts

Lecture 57 - Curved Surface Geometry

Lecture 58 - Cutter Path Generation for Curved Surfaces

Lecture 59 - Cutter Path Generation (Concluding Part) and Current Status - CNC Machining and Related Processes

Lecture 60 - Questions and Discussions on Curved Surface Machining

NPTEL : NOC:Finite Element Method (Mechanical Engineering)

Co-ordinators : Prof. Biswanath Banerjee, Prof. Amit Shaw

NPTEL : NOC:Product Engineering and Design Thinking (Mechanical Engineering)

Co-ordinators : Prof. Pranab K Dan, Prof. Prabir Sarkar

NPTEL : NOC:Microfluidics and Nanofluidics (Mechanical Engineering)

Co-ordinators : Prof. Suman Chakraborty

NPTEL : NOC:Industrial Robotics: Theories for Implementation (Mechanical Engineering)

Co-ordinators : Dr. Arun Dayal Udai

NPTEL : NOC:Cryogenic Hydrogen Technology (Mechanical Engineering)

Co-ordinators : Prof. Indranil Ghosh

NPTEL : NOC:Industrial Hydraulics and Automation (Mechanical Engineering)

Co-ordinators : Prof. Niranjan Kumar, Prof. Ajit Kumar

NPTEL : Advanced Gas Dynamics (Mechanical Engineering)

Co-ordinators : Dr. Rinku Mukherjee

NPTEL : Design and Optimization of Energy systems (Mechanical Engineering)

Co-ordinators : Prof. C. Balaji

NPTEL : Engineering Fracture Mechanics (Mechanical Engineering)

Co-ordinators : Prof. K. Ramesh

NPTEL : Experimental Stress Analysis (Mechanical Engineering)

Co-ordinators : Prof. K. Ramesh

NPTEL : Rocket Propulsion (Mechanical Engineering)

Co-ordinators : Prof. K. Ramamurthi

NPTEL : Advanced Finite Elements Analysis (Mechanical Engineering)

Co-ordinators : Dr. R. Krishnakumar

NPTEL : Advanced Operations Research (Mechanical Engineering)

Co-ordinators : Prof. G. Srinivasan

NPTEL : Fundamentals of Operations Research (Mechanical Engineering)

Co-ordinators : Prof. G. Srinivasan

NPTEL : Introduction to Finite Element Method (Mechanical Engineering)

Co-ordinators : Dr. R. Krishnakumar

NPTEL : Mechanical Measurements and Metrology (Mechanical Engineering)

Co-ordinators : Prof. Shunmugam M. S, Prof. S.P. Venkateshan

NPTEL : Principles of Mechanical Measurements (Mechanical Engineering)

Co-ordinators : Prof. R. Raman

NPTEL : Spray Theory and Applications (Mechanical Engineering)

Co-ordinators : Prof. Mahesh Panchagnula, Dr. Paul E. Sojka

NPTEL : Conduction And Radiation (Mechanical Engineering)

Co-ordinators : Prof. C. Balaji

NPTEL : Gas Dynamics and Propulsion (Mechanical Engineering)

Co-ordinators : Prof. V. Babu

NPTEL : Microfluidics (Mechanical Engineering)

Co-ordinators : Dr. Ashis Kumar Sen

NPTEL : Convective Heat Transfer (Mechanical Engineering)

Co-ordinators : Dr. Arvind Pattamatta, Prof. Ajit K. Kolar

NPTEL : Introduction to Explosions and Explosion Safety (Mechanical Engineering)

Co-ordinators : Prof. K. Ramamurthi

NPTEL : Metrology (Mechanical Engineering)

Co-ordinators : Dr. K. Sadashivappa

NPTEL : NOC:Engineering Mechanics Statics and Dynamics (Mechanical Engineering)

Co-ordinators : Prof. Mahesh Panchagnula

Lecture 32 - Impulse / Momentum - Example 4

Lecture 33 - Work Energy Methods - Example 1

Lecture 34 - Work Energy Methods - Example 2

Lecture 35 - Work Energy Methods - Example 3

NPTEL : NOC:Foundation of Computational Fluid Dynamics (Mechanical Engineering)

Co-ordinators : Dr.S.Vengadesan

NPTEL : NOC:Introduction to Boundary Layers (Mechanical Engineering)

Co-ordinators : Dr. Rinku Mukherjee

Lecture 1 - Review of fundamentals of fluid mechanics - I

Lecture 2 - Review of fundamentals of fluid mechanics - II

Lecture 3 - Concept of a Boundary Layer (BL) - I

Lecture 4 - Concept of a Boundary Layer (BL) - II

Lecture 5 - Concepts of BL thickness (?)

Lecture 6 - Concepts of BL displacement thickness (?*) and BL momentum thickness (?)

Lecture 7 - Control Volume approach to derive expressions for ?* over a flat plate

Lecture 8 - Control Volume approach to derive expressions for ? over a flat plate

Lecture 9 - Concept of wall friction

Lecture 10 - Concept of friction drag

Lecture 11 - Skin Friction Coefficient - I

Lecture 12 - Skin Friction Coefficient - II

Lecture 13 - Derivation of Prandtls Laminar BL Equations - I

Lecture 14 - Derivation of Prandtls Laminar BL Equations - II

Lecture 15 - Derivation of Prandtls Laminar BL Equations - III

Lecture 16 - Derivation of Prandtls Laminar BL Equations - IV

Lecture 17 - Similarity Solutions to the BL Equations Applied to a Flat Plate - I

Lecture 18 - Similarity Solutions to the BL Equations Applied to a Flat Plate - II

Lecture 19 - Similarity Solutions to the BL Equations Applied to a Flat Plate - III

Lecture 20 - Runge-Kutta Method to Numerically Solve the BL Equations Applied to a Flat Plate

Lecture 21 - Description of the Numerical Code to Solve the BL Equations Applied to a Flat Plate

Lecture 22 - Similarity Solutions to the BL Equations (other than flat plate) - I

Lecture 23 - Similarity Solutions to the BL Equations (other than flat plate) - II

Lecture 24 - Similarity Solutions to the BL Equations (other than flat plate) - III

Lecture 25 - Similarity Solutions to the BL Equations (other than flat plate) - IV

Lecture 26 - Description of the Numerical Code to Solve the BL Equations (other than flat plate)

Lecture 27 - The Energy Equation - I

Lecture 28 - The Energy Equation - II

Lecture 29 - Similarity Solutions to Thermal BL - I

Lecture 30 - Similarity Solutions to Thermal BL - II

Lecture 31 - Similarity Solutions to Thermal BL - III

NPTEL : NOC:Fundamentals of Gas Dynamics (Mechanical Engineering)

Co-ordinators : Prof.A. Sameen

NPTEL : NOC:Experimental Stress Analysis - An Overview (Mechanical Engineering)

Co-ordinators : Prof. K. Ramesh

Lecture 32 - Selection of an experimental technique - Part 2

NPTEL : NOC:Fluid Dynamics and Turbomachines (Mechanical Engineering)

Co-ordinators : Prof. Dhiman Chatterjee, Prof. Shamit Bakshi

NPTEL : NOC:Micro and Nano Scale Energy Transport (Mechanical Engineering)

Co-ordinators : Dr. Arvind Pattamatta

Lecture 1 - Overview to Micro/Nanoscale energy transport - Part 1

Lecture 2 - Overview to Micro/Nanoscale energy transport - Part 2

Lecture 3 - Some applications of Micro/Nanoscale energy transport

Lecture 4 - Continuum heat transfer and its limitation

Lecture 5 - Energy carriers at Micro/Nanoscale and their attributes

Lecture 6 - Microscopic contributes to Internal energy of a systems

Lecture 7 - Fundamentals of Quantum mechanics - Part 1

Lecture 8 - Fundamentals of Quantum mechanics - Part 2

Lecture 9 - Fundamentals of Quantum mechanics - Part 3

Lecture 10 - Fundamentals of Quantum mechanics - Part 4

Lecture 11 - Fundamentals of Quantum mechanics - Part 5

Lecture 12 - Fundamentals of solid state physics - Part 1

Lecture 13 - Fundamentals of solid state physics - Part 2

Lecture 14 - Fundamentals of solid state physics - Part 3

Lecture 15 - Fundamentals of solid state physics - Part 4

Lecture 16 - Fundamentals of statistical thermodynamics - Part 1

Lecture 17 - Fundamentals of statistical thermodynamics - Part 2

Lecture 18 - Fundamentals of statistical thermodynamics - Part 3

Lecture 19 - Fundamentals of statistical thermodynamics - Part 4

Lecture 20 - Kinetic theory of energy carriers - Part 1

Lecture 21 - Kinetic theory of energy carriers - Part 2

Lecture 22 - Non-equilibrium energy transport at Nanoscales: Boltzmann Transport Equation (BTE)

Lecture 23 - Boltzmann Transport Equation under the relaxation time approximation

Lecture 24 - Derivation of Continuum laws from Boltzmann Transport Equation - Part 1

Lecture 25 - Derivation of Continuum laws from Boltzmann Transport Equation - Part 2

Lecture 26 - Derivation of Continuum laws from Boltzmann Transport Equation - Part 3

Lecture 27 - Nanoscale Energy transport in a Thin Film - Part 1

Lecture 28 - Nanoscale Energy transport in a Thin Film - Part 2

Lecture 29 - Nanoscale Energy transport in a Thin Film - Part 3

Lecture 30 - Gas flow and Heat transport in Microchannels - Part 1

Lecture 31 - Gas flow and Heat transport in Microchannels - Part 2

NPTEL : NOC:Electron Diffraction and Imaging (Mechanical Engineering)

Co-ordinators : Prof. Sundararaman M

NPTEL : NOC:Acoustic and Noise Control (Mechanical Engineering)

Co-ordinators : Prof. Abijith Sarkar

NPTEL : NOC:Steel Quality - Role of Secondary Refining and Continuous Casting (Mechanical Engineering)

Co-ordinators : Prof. Santanu Kr. Ray

NPTEL : NOC:X-ray Crystallography and Diffraction (Mechanical Engineering)

Co-ordinators : Prof. Ranjit Kumar Ray

NPTEL : NOC:Transport Phenomena in Materials (Mechanical Engineering)

Co-ordinators : Dr. G. Phanikumar

NPTEL : NOC:Experimental Stress Analysis - An Overview (Mechanical Engineering)

Co-ordinators : Prof. K. Ramesh

NPTEL : NOC:Mechanics of Human Movement (Mechanical Engineering)

Co-ordinators : Prof. Sujatha Srinivasan

NPTEL : NOC:Design for Quality, Manufacturing and Assembly (Mechanical Engineering)

Co-ordinators : Prof. Palaniappaan Ramu

NPTEL : NOC:Surrogates and Approximations in Engineering Design (Mechanical Engineering)

Co-ordinators : Prof. Palaniappaan Ramu

NPTEL : NOC:Steel Quality: Role of Secondary Refining and Continuous Casting (Mechanical Engineering)

Co-ordinators : Prof. Santanu Kr. Ray

NPTEL : Theory of Mechanism (Mechanical Engineering)

Co-ordinators : Prof. Sujatha Srinivasan

NPTEL : NOC:Engineering Mechanics (Mechanical Engineering)

Co-ordinators : Prof. K. Ramesh

NPTEL : NOC:Foundations of Computational Materials Modelling (Mechanical Engineering)

Co-ordinators : Dr.Narasimhan Swaminathan

NPTEL : NOC:Fundamentals of Combustion for Propulsion (Mechanical Engineering)

Co-ordinators : Prof. S Varunkumar, Prof. H S Mukunda

NPTEL : NOC:Basics of Materials Engineering (Mechanical Engineering)

Co-ordinators : Prof. Ratna Kumar Annabattula

NPTEL : NOC:Computational Fluid Dynamics using Finite Volume Method (Mechanical Engineering)

Co-ordinators : Prof. Kameswararao Anupindi

NPTEL : NOC:Wheeled Mobile Robots (Mechanical Engineering)

Co-ordinators : Prof. Asokan Thondiyath, Prof. Santhakumar Mohan

NPTEL : NOC:Fundamentals of Combustion (Mechanical Engineering)

Co-ordinators : Prof. V. Raghavan

Lecture 31 - Characteristics of combustion flame and detonation - Part 3 - Rankine-Hugoniot relation

Lecture 32 - Characteristics of combustion flame and detonation - Part 4 - Estimation of detonation velocity and Worked examples

Lecture 33 - Laminar Premixed Flames - Part 1 - Laminar flame propagation

Lecture 34 - Laminar Premixed Flames - Part 2 - Laminar flame speed variation and Structure of premixed flames

Lecture 35 - Laminar Premixed Flames - Part 3 - Flammability limits and Premixed flame theory

Lecture 36 - Laminar Premixed Flames - Part 4 - Estimation of laminar flame speed

Lecture 37 - Laminar Premixed Flames - Part 5 - Ignition of premixed mixture (Semenov's Analysis)

Lecture 38 - Laminar Premixed Flames - Part 6 - Piloted ignition and Flame quenching

Lecture 39 - Laminar Premixed Flames - Part 7 - Premixed flame stability

Lecture 40 - Laminar Premixed Flames - Part 8 - Stability Maps and Worked examples

Lecture 41 - Laminar Diffusion Flames - Part 1 - Theory of gas jets

Lecture 42 - Laminar Diffusion Flames - Part 2 - Analysis of gas jets and jet diffusion flames

Lecture 43 - Laminar Diffusion Flames - Part 3 - Diffusion flame characteristics and flame structure

Lecture 44 - Laminar Diffusion Flames - Part 4 - Diffusion flame structure and Flame regimes

Lecture 45 - Laminar Diffusion Flames - Part 5 - Diffusion flame regimes and Flame height correlations

Lecture 46 - Laminar Diffusion Flames - Part 6 - Diffusion flame control

Lecture 47 - Laminar Diffusion Flames - Part 7 - Diffusion flame configurations (coflow, crossflow and opposed flow flames)

Lecture 48 - Laminar Diffusion Flames - Part 8 - Diffusion flame stability and Worked examples

Lecture 49 - Turbulent Flames - Part 1 - Characteristics of turbulence

Lecture 50 - Turbulent Flames - Part 2 - Turbulent length scales and turbulent stresses

Lecture 51 - Turbulent Flames - Part 3 - Axisymmetric turbulent jet

Lecture 52 - Turbulent Flames - Part 4 - Turbulent premixed flames and flame regimes

Lecture 53 - Turbulent Flames - Part 5 - Turbulent diffusion flames

Lecture 54 - Droplet evaporation and combustion - Part 1 - Steady evaporation of liquid droplet

Lecture 55 - Droplet evaporation and combustion - Part 2 - Equilibrium under steady evaporation of liquid droplet and droplet combustion

Lecture 56 - Droplet evaporation and combustion - Part 3 - Droplet combustion (simplified analysis)

Lecture 57 - Droplet evaporation and combustion - Part 4 - Species and temperature profiles

Lecture 58 - Droplet evaporation and combustion - Part 5 - Evaluation of mass burning rate and worked examples

Lecture 59 - Combustion of carbon particle - Part 1 - Coal combustion

Lecture 60 - Combustion of carbon particle - Part 2 - One film model

Lecture 61 - Combustion of carbon particle - Part 3 - Two film model and worked examples

NPTEL : NOC:Oil Hydraulics and Pneumatics (Mechanical Engineering)

Co-ordinators : Prof. Somashekhar S

Lecture 28 - What causes Pressure Drop ?, Minimising Pressure Drop, Air Distribution System- Sizing of Pipes, Tubes, Materials and Fittings, Important Air Flow Parameters

Lecture 29 - Pressure drop Predictions using Various Empirical Formulae and Nomogram, Best Practices for Compressed Air Piping System and Installation Tips

Lecture 30 - Need for Air Dryer, Analysis of Moisture Removal from Air, Typical Air Drying Methods, Basic Types of Air Dryers

Lecture 31 - Construction and Operation of Refrigerated Air dyers, Absorption Dryer, Adsorption Dryer, Membrane Dryer, How to Choose the Right Air Dryer?

Lecture 32 - Directional Control Valves

Lecture 33 - Directional Control Valves

Lecture 34 - Directional Control Valves

Lecture 35 - Directional Control Valves

Lecture 36 - Directional Control Valves

Lecture 37 - Pressure Control Valves

Lecture 38 - Pressure Control Valves

Lecture 39 - Pressure Control Valves

Lecture 40 - Flow Control Valves

Lecture 41 - Flow Control Valves

Lecture 42 - Flow Control Valves

Lecture 43 - Estimation of leakage through spool and housing bore and Numericals on DCV, PCV and FCV

Lecture 44 - Estimation of leakage through spool and housing bore and Numericals on DCV, PCV and FCV

Lecture 45 - Hydraulic Motors

Lecture 46 - Hydraulic Motors

Lecture 47 - Hydraulic Motors

Lecture 48 - Hydraulic Motors

Lecture 49 - Hydraulic Motors

Lecture 50 - Hydraulic Motors

Lecture 51 - Hydraulic Cylinders

Lecture 52 - Hydraulic Cylinders

Lecture 53 - Hydraulic Cylinders

Lecture 54 - Hydraulic Cylinders

Lecture 55 - Hydraulic Cylinders

Lecture 56 - Numericals on Fluid Power Actuators

Lecture 57 - Numericals on Fluid Power Actuators

Lecture 58 - Subsystems: Hydraulic Reservoir, Coolers and Filters

Lecture 59 - Subsystems: Hydraulic Reservoir, Coolers and Filters

NPTEL : Introduction to Turbomachines (Mechanical Engineering)

Co-ordinators : Prof. Babu Viswanathan

NPTEL : NOC:Mechanics and Control of Robotic Manipulators (Mechanical Engineering)

Co-ordinators : Prof. Santhakumar Mohan

NPTEL : Inverse Methods in Heat Transfer (Mechanical Engineering)

Co-ordinators : Prof. C.Balaji, Prof.S. Balaji

NPTEL : Engineering Thermodynamics (Mechanical Engineering)

Co-ordinators : Prof. Babu Viswanathan

NPTEL : Applied Mechanics - Fluid Mechanics Laboratory (Mechanical Engineering)

Co-ordinators : Unknown

NPTEL : NOC:Interfacial Fluid Mechanics (Mechanical Engineering)

Co-ordinators : Prof. Harish N Dixit

NPTEL : Applied Thermodynamics (Mechanical Engineering)

Co-ordinators : Dr. Babu Viswanathan

NPTEL : Heat Transfer (Prof .Dr.C. Balaji) (Mechanical Engineering)

Co-ordinators : Prof .Dr.C. Balaji

NPTEL : NOC:Inverse Methods in Heat Transfer (Mechanical Engineering)

Co-ordinators : Prof. Balaji Srinivasan

NPTEL : NOC:Sustainable Energy Technology (Mechanical Engineering)

Co-ordinators : Dr. Sayak Banerjee

NPTEL : NOC:Strength of Materials - IITM (Mechanical Engineering)

Co-ordinators : Prof. K. Ramesh

NPTEL : NOC:Engineering Thermodynamics (Mechanical Engineering)

Co-ordinators : Prof. V. Raghavan

Lecture 32 - Tutorial 4 - Systems involving ideal gas mixtures - Part 3

Lecture 33 - Tutorial 5 - Systems involving Steam and R134a using table - Part 1

Lecture 34 - Tutorial 5 - Systems involving Steam and R134a using table - Part 2

Lecture 35 - Tutorial 5 - Systems involving Steam and R134a using table - Part 3

Lecture 36 - Tutorial 5 - Systems involving Steam and R134a using table - Part 4

Lecture 37 - Tutorial 5 - Systems involving Steam and R134a using table - Part 5

Lecture 38 - Tutorial 5 - Systems involving Steam and R134a using table - Part 6

Lecture 39 - First law of thermodynamics for a control colume

Lecture 40 - Control volume analysis of steady flow devices - Part 1

Lecture 41 - Control volume analysis of steady flow devices - Part 2

Lecture 42 - Control volume analysis of steady flow devices - Part 3

Lecture 43 - Unsteady analysis

Lecture 44 - Tutorial 6 - First law for control volumes

Lecture 45 - Second law of Thermodynamics - Part 1

Lecture 46 - Second law of Thermodynamics - Part 2

Lecture 47 - Second law of Thermodynamics - Part 3

Lecture 48 - Second law of Thermodynamics - Part 4

Lecture 49 - Second law of Thermodynamics - Part 5

Lecture 50 - Tutorial 7 - Second law of thermodynamics - Part 1

Lecture 51 - Tutorial 7 - Second law of thermodynamics - Part 2

Lecture 52 - Tutorial 7 - Second law of thermodynamics - Part 3

Lecture 53 - Tutorial 7 - Second law of thermodynamics - Part 4

Lecture 54 - Tutorial 7 - Second law of thermodynamics - Part 5

Lecture 55 - Entropy - Part 1

Lecture 56 - Entropy - Part 2

Lecture 57 - Entropy - Part 3

Lecture 58 - Entropy - Part 4

Lecture 59 - Entropy - Part 5

Lecture 60 - Entropy - Part 6

Lecture 61 - Tutorial 8 - Entropy - Part 1

Lecture 62 - Tutorial 8 - Entropy - Part 2

Lecture 63 - Tutorial 8 - Entropy - Part 3

Lecture 64 - Tutorial 8 - Entropy - Part 4

NPTEL : NOC:Theory of Fire Propagation (Fire Dynamics) (Mechanical Engineering)

Co-ordinators : Prof. V. Raghavan

NPTEL : NOC:Applied Thermodynamics (2024) (Mechanical Engineering)

Co-ordinators : Prof. V. Raghavan

Lecture 32 - Thermodynamic cycles - Air standard Brayton cycle - Part 3

Lecture 33 - Thermodynamic cycles - Air standard Brayton cycle - Part 4

Lecture 34 - Thermodynamic cycles - Air standard Brayton cycle - Part 5

Lecture 35 - Thermodynamic cycles - Air standard Otto cycle

Lecture 36 - Thermodynamic cycles - Air standard Diesel cycle - Part 1

Lecture 37 - Thermodynamic cycles - Air standard Diesel cycle - Part 2

Lecture 38 - Thermodynamic cycles - Vapor compression refrigeration cycle

Lecture 39 - Psychrometry - Part 1

Lecture 40 - Psychrometry - Part 2

Lecture 41 - Psychrometry - Part 3

Lecture 42 - Psychrometry - Part 4

Lecture 43 - Psychrometry - Part 5

Lecture 44 - Psychrometry - Part 6

Lecture 45 - Psychrometry - Part 7

Lecture 46 - Tutorial 7 - Psychometry and Air conditioning processes - Part 1

Lecture 47 - Tutorial 7 - Psychometry and Air conditioning processes - Part 2

Lecture 48 - Tutorial 8 - Psychometry and Air conditioning processes - Part 3

Lecture 49 - Tutorial 8 - Psychometry and Air conditioning processes - Part 4

Lecture 50 - Combustion Thermodynamics - Part 1

Lecture 51 - Combustion Thermodynamics - Part 2

Lecture 52 - Combustion Thermodynamics - Part 3

Lecture 53 - Combustion Thermodynamics - Part 4

Lecture 54 - Tutorial 9 - Stoichiometry - Part 1

Lecture 55 - Tutorial 9 - Stoichiometry - Part 2

Lecture 56 - Tutorial 10 - Heat and temperature calculations in combustion - Part 1

Lecture 57 - Tutorial 10 - Heat and temperature calculations in combustion - Part 2

Lecture 58 - Tutorial 10 - Heat and temperature calculations in combustion - Part 3

Lecture 59 - Tutorial 10 - Heat and temperature calculations in combustion - Part 4

Lecture 60 - Tutorial 10 - Heat and temperature calculations in combustion - Part 5

Lecture 61 - Compressible flow through nozzles - Part 1

Lecture 62 - Compressible flow through nozzles - Part 2

Lecture 63 - Compressible flow through nozzles - Part 3

Lecture 64 - Compressible flow through nozzles - Part 4

NPTEL : NOC:Design of Mechanical Transmission Systems (Mechanical Engineering)

Co-ordinators : Prof. Ramkumar

NPTEL : Advanced Manufacturing Processes (Mechanical Engineering)

Co-ordinators : Dr. A.K. Sharma

NPTEL : Computational Fluid Dynamics (Dr. K.M. Singh) (Mechanical Engineering)

Co-ordinators : Dr. K.M. Singh

Lecture 1 - General Introduction: Historical Background and Spectrum of Applications

Lecture 2 - CFD: Simulation Process and Course Outline

Lecture 3 - Conservation Laws and Mathematical Preliminaries

Lecture 4 - Mass Conservation: Continuity Equation

Lecture 5 - Momentum Equation: Newtonâ€™s 2nd Law

Lecture 6 - Momentum Equation: Navier-Stokes Equations

Lecture 7 - Navier-Stokes Equation and its Simplified Forms

Lecture 8 - Energy and Scalar Transport Equations

Lecture 9 - Scalar Transport, Mathematical Classification and Boundary Conditions

Lecture 10 - Finite Difference Method: Methodology and Grid Notation

Lecture 11 - Finite Difference Approximation of First Order Derivatives

Lecture 12 - Finite Difference Approximation of Second Order Derivatives - 1

Lecture 13 - Finite Difference Approximation of Second Order Derivatives - 2

Lecture 14 - Approximation of Mixed Derivatives and Multi-Dimensional F.D. Formulae

Lecture 15 - Implementation of Boundary Conditions and Finite Difference Algebraic System

Lecture 16 - Applications of FDM to Scalar Transport Problems - 1

Lecture 17 - Applications of FDM to Scalar Transport Problems - 2

Lecture 18 - Application of FDM to Advection-Diffusion and Computer Implementation Aspects

Lecture 19 - Computer Implementation of FDM for Steady State Heat Diffusion Problems - 1

Lecture 20 - Computer Implementation of FDM for Steady State Heat Diffusion Problems - 2

Lecture 21 - Computer Implementation of FDM for Steady State Heat Diffusion Problems - 3

Lecture 22 - Solution of Discrete Algebraic Systems

Lecture 23 - Direct and Basic Iterative Methods for Linear Systems

Lecture 24 - Accelerated Iterative Methods for Linear Systems

Lecture 25 - Two Level and Multi-Level Methods for First Order IVPs - 1

Lecture 26 - Two Level and Multi-Level Methods for First Order IVPs - 2

Lecture 27 - Application to Unsteady Transport Problems

Lecture 28 - Introduction to Finite Volume Method

Lecture 29 - Finite Volume Interpolation Schemes

Lecture 30 - Application of FVM to Scalar Transport

Lecture 31 - Introduction to Finite Element Method

NPTEL : Metal Casting (Mechanical Engineering)

Co-ordinators : Dr. D. B. Karunakar

NPTEL : Processing of non metals (Mechanical Engineering)

Co-ordinators : Dr. Inderdeep Singh

NPTEL : Vibration control (Mechanical Engineering)

Co-ordinators : Dr. S. P. Harsha

NPTEL : Welding Engineering (Mechanical Engineering)

Co-ordinators : Dr. D.K. Dwivedi

NPTEL : Industrial Engineering (Mechanical Engineering)

Co-ordinators : Prof. P.K. Jain, Dr. Pradeep Kumar, Dr. Inderdeep Singh, Dr. D.K. Dwivedi

NPTEL : Manufacturing Processes I (Mechanical Engineering)

Co-ordinators : Dr. D.B. Karunakar, Dr. Inderdeep Singh. Dr. D.K. Dwivedi

NPTEL : Strength of Materials (Mechanical Engineering)

Co-ordinators : Dr. S.P. Harsha

Lecture 1 - Solid Mechanics

Lecture 2 - Strength of Materials

Lecture 3 - Strength of Materials

Lecture 4 - Solid Mechanics

Lecture 5 - Strength of Materials

Lecture 6 - Strength of Materials

Lecture 7 - Strength of Materials

Lecture 8 - Strength of Materials

Lecture 9 - Strength of Materials

Lecture 10 - Strength of Materials

Lecture 11 - Strength of Materials

Lecture 12 - Strength of Materials

Lecture 13 - Strength of Materials

Lecture 14 - Strength of Materials

Lecture 15 - Strength of Materials

Lecture 16 - Strength of Materials

Lecture 17 - Strength of Materials

Lecture 18 - Strength of Materials

Lecture 19 - Strength of Materials

Lecture 20 - Strength of Materials

Lecture 21 - Strength of Materials

Lecture 22 - Strength of Materials

Lecture 23 - Strength of Materials

Lecture 24 - Strength of Materials

Lecture 25 - Strength of Materials

Lecture 26 - Strength of Materials

Lecture 27 - Strength of Materials

Lecture 28 - Strength of Materials

Lecture 29 - Strength of Materials

Lecture 30 - Strength of Materials

Lecture 31 - Strength of Materials

NPTEL : NOC:Two Phase Flow and Heat Transfer (Mechanical Engineering)

Co-ordinators : Dr. Arup Kumar Das

NPTEL : NOC:Refrigeration and Air-Conditioning (Mechanical Engineering)

Co-ordinators : Prof. Ravi Kumar

NPTEL : NOC:Engineering Economic Analysis (Mechanical Engineering)

Co-ordinators : Dr. Pradeep K. Jha

NPTEL : NOC:Convective Heat Transfer (Mechanical Engineering)

Co-ordinators : Dr. Arup Kumar Das

NPTEL : NOC:Introduction to Mechanical Vibration (Mechanical Engineering)

Co-ordinators : Prof. Anil Kumar

NPTEL : NOC:Joining Technologies for Metals (Mechanical Engineering)

Co-ordinators : Prof. Dheerendra Kumar Dwivedi

NPTEL : NOC:Modelling and Simulation of Dynamic Systems (Mechanical Engineering)

Co-ordinators : Prof. Pushparaj Mani Pathak

NPTEL : NOC:Principles of Casting Technology (Mechanical Engineering)

Co-ordinators : Dr. Pradeep K. Jha

NPTEL : NOC:Steam and Gas Power Systems (Mechanical Engineering)

Co-ordinators : Prof. Ravi Kumar

NPTEL : NOC:Product Design and Development (Mechanical Engineering)

Co-ordinators : Prof. Indradeep Singh

NPTEL : NOC:Fundamentals of Manufacturing Processes (Mechanical Engineering)

Co-ordinators : Dr. D. K. Dwivedi

NPTEL : NOC:Modelling and Simulation of Discrete Event System (Mechanical Engineering)

Co-ordinators : Dr. Pradeep K. Jha

NPTEL : NOC:Processing of Polymers and Polymer Composites (Mechanical Engineering)

Co-ordinators : Dr. Inderdeep Singh

NPTEL : NOC:Operations Management (Mechanical Engineering)

Co-ordinators : Dr. Inderdeep Singh

NPTEL : NOC:Theory of Production Processes (Mechanical Engineering)

Co-ordinators : Dr. Pradeep K. Jha

NPTEL : NOC:Automatic Control (Mechanical Engineering)

Co-ordinators : Dr. Anil Kumar

NPTEL : NOC:Failure Analysis and Prevention (Mechanical Engineering)

Co-ordinators : Dr. D. K. Dwivedi

NPTEL : NOC:Mechanical Measurement System (Mechanical Engineering)

Co-ordinators : Prof. Ravi Kumar

Lecture 32 - Piezoelectric transducers

Lecture 33 - Pressure measurement

Lecture 34 - Force and torque measurement

Lecture 35 - Displacement and acceleration measurement

Lecture 36 - Sound measurement

Lecture 37 - Thermophysical properties measurement

Lecture 38 - Flow visualization

Lecture 39 - Air pollution sampling and measurement

Lecture 40 - Problem solving - 2

NPTEL : NOC:Fundamentals of Surface Engineering: Mechanisms, Processes and Characterizations (Mechanical Engineering)

Co-ordinators : Dr. D. K. Dwivedi

NPTEL : NOC:Work System Design (Mechanical Engineering)

Co-ordinators : Dr. Inderdeep Singh

NPTEL : NOC:Principles of Metal Forming Technology (Mechanical Engineering)

Co-ordinators : Dr. Pradeep K. Jha

NPTEL : NOC:Radiative Heat Transfer (Mechanical Engineering)

Co-ordinators : Prof. Ankit Bansal

NPTEL : NOC:Weldability of Metals (Mechanical Engineering)

Co-ordinators : Dr. D. K. Dwivedi

NPTEL : NOC:Manufacturing Guidelines for Product Design (Mechanical Engineering)

Co-ordinators : Dr. Inderdeep Singh

NPTEL : NOC:Inspection and Quality Control in Manufacturing (Mechanical Engineering)

Co-ordinators : Prof. Kaushik Pal

NPTEL : NOC:Financial Mathematics (Mechanical Engineering)

Co-ordinators : Dr. Pradeep K. Jha

NPTEL : NOC:Product Design Using Value Engineering (Mechanical Engineering)

Co-ordinators : Dr. Inderdeep Singh

NPTEL : NOC:Selection of Nanomaterials for Energy Harvesting and Storage Application (Mechanical Engineering)

Co-ordinators : Prof. Kaushik Pal

NPTEL : NOC:Robotics and Control: Theory and Practice (Mechanical Engineering)

Co-ordinators : Prof. N. Sukavanam, Prof. M. Felix Orlando

NPTEL : NOC:Acoustic Metamaterials (Mechanical Engineering)

Co-ordinators : Prof. Sneha Singh

NPTEL : NOC:Power Plant Engineering (Mechanical Engineering)

Co-ordinators : Prof. Ravi Kumar

NPTEL : NOC:Principles of Industrial Engineering (Mechanical Engineering)

Co-ordinators : Prof. D K Dwivedi

NPTEL : NOC:Mechatronics (Mechanical Engineering)

Co-ordinators : Prof. Pushparaj Mani Pathak

NPTEL : Micro and Smart Systems (Mechanical Engineering)

Co-ordinators : Dr. K.J. Vinoy, Prof. S. Gopalakrishnan, Prof. K.N. Bhat, Prof. G.K. Anathasuresh

NPTEL : NOC:Variational Methods in Mechanics (Mechanical Engineering)

Co-ordinators : Prof. G.K. Anathasuresh

NPTEL : NOC:Compliant Mechanisms: Principles and Design (Mechanical Engineering)

Co-ordinators : Prof. G. K. Ananthasuresh

NPTEL : NOC:Heat Transfer and Combustion in Multiphase Systems (Mechanical Engineering)

Co-ordinators : Prof. Saptarshi Basu

Lecture 1 - Introduction to Multiphase

Lecture 2 - Thermodynamics of Multiphase systems

Lecture 3 - Thermodynamics of Interface - I

Lecture 4 - Thermodynamics of Interface - II

Lecture 5 - Interfacial phenomena key concepts - I

Lecture 6 - Interfacial phenomena key concepts - II

Lecture 7 - Interfacial heat and mass transfer - I - Interfacial mass, momentum and energy balance, Surface tension, WettingL07

Lecture 8 - Interfacial heat and mass transfer - II - Interfacial dynamics, Instabilities of the interface

Lecture 9 - Interfacial heat and mass transfer - III - Evaporation from thin films

Lecture 10 - Governing equations and interfacial conditions

Lecture 11 - Governing equations : Averaging techniques - I

Lecture 12 - Governing equations : Averaging techniques - II

Lecture 13 - Governing equations : Averaging techniques - III

Lecture 14 - Interface shapes

Lecture 15 - Transport processes at interface with key concepts - I

Lecture 16 - Transport processes at interface with key concepts - II

Lecture 17 - Interfacial transport

Lecture 18 - Interfacial transport including dynamic behavior

Lecture 19 - Interface behavior

Lecture 20 - Heat transfer and evaporation in droplets

Lecture 21 - Droplet vaporization models - I

Lecture 22 - Droplet vaporization models - II

Lecture 23 - Droplet vaporization dynamics - I

Lecture 24 - Droplet vaporization dynamics - II

Lecture 25 - Droplet liquid phase transport

Lecture 26 - Comprehensive droplet vaporization model and correlations - I

Lecture 27 - Comprehensive droplet vaporization model and correlations - II

Lecture 28 - Comparison of droplet vaporization models

Lecture 29 - Species transport in droplet

Lecture 30 - Heat transfer and transport processes in sessile droplets

Lecture 31 - Introduction to atomization

NPTEL : NOC:Convective Heat Transfer (2018) (Mechanical Engineering)

Co-ordinators : Prof. Saptarshi Basu

NPTEL : NOC:A Short Lecture series on Contour Integration in the Complex Plane (Mechanical Engineering)

Co-ordinators : Prof. Venkata Sonti

NPTEL : NOC:Introduction to Soft Matter (Mechanical Engineering)

Co-ordinators : Prof. Aloke Kumar

NPTEL : NOC:Robotics: Basics and Selected Advanced Concepts (Mechanical Engineering)

Co-ordinators : Prof. Ashitava Ghosal

Lecture 1 - Introduction, Types and Classification of Robots

Lecture 2 - Main Elements of a Robot

Lecture 3 - Modelling and Analysis of Robots

Lecture 4 - Mathematical Preliminaries, Homogeneous Transformations

Lecture 5 - Elements of robot - Joints, Elements of robots - Links

Lecture 6 - Examples of D-H parameters and Link transformation matrices

Lecture 7 - Introduction, Direct Kinematics of Serial Robots

Lecture 8 - Inverse Kinematics of Serial Robots

Lecture 9 - Inverse Kinematics of Serial Robots with n < 6, Inverse Kinematics of Serial Robots with n > 6

Lecture 10 - Elimination Theory and Solution of Non-linear Equations, Inverse Kinematics of a General 6R Robot

Lecture 11 - Introduction, Loop-closure Equations

Lecture 12 - Direct Kinematics of Parallel Manipulators

Lecture 13 - Mobility of Parallel Manipulators

Lecture 14 - Inverse Kinematics of Parallel Manipulators

Lecture 15 - Direct Kinematics of Stewart Platform Manipulators

Lecture 16 - Sun tracking using 3-DOF parallel manipulator

Lecture 17 - Stewart-Gough platform-based force-torque sensor

Lecture 18 - Vibration isolation using a Stewart-Gough platform

Lecture 19 - Introduction, Linear and Angular Velocity of Links

Lecture 20 - Serial Manipulator Jacobian Matrix

Lecture 21 - Parallel Manipulator Jacobian Matrix

Lecture 22 - Singularities in Serial and Parallel Manipulators

Lecture 23 - Statics of Serial and Parallel Manipulators

Lecture 24 - Hyper-redundant robots

Lecture 25 - Redundancy resolution in human arm

Lecture 26 - Flexible robots

Lecture 27 - Introduction, Lagrangian formulation

Lecture 28 - Examples of Equations of Motion

Lecture 29 - Inverse Dynamics and Simulation of Equations of Motion

Lecture 30 - Recursive Formulations of Dynamics of Manipulators

Lecture 31 - Motion planning

NPTEL : NOC:Sound and Structural Vibration (Mechanical Engineering)

Co-ordinators : Prof. Venkata R. Sonti

NPTEL : NOC:Vibrations of Plates and Shells (Mechanical Engineering)

Co-ordinators : Prof. Venkata R. Sonti

NPTEL : NOC:Dynamics and Control of Mechanical Systems (Mechanical Engineering)

Co-ordinators : Prof. Ashitava Ghosal

Lecture 32 - 3 Case Studies

NPTEL : NOC:Optical Methods for Solid and Fluid Mechanics (Mechanical Engineering)

Co-ordinators : Prof. Aloke Kumar, Prof. Koushik Viswanathan

NPTEL : NOC:Statistical Thermodynamics for Engineers (Mechanical Engineering)

Co-ordinators : Prof. Saptarshi Basu