NPTEL Video Course - Mechanical Engineering - Convective Heat and Mass Transfer

Subject Co-ordinator - Prof. A.W. Date

Co-ordinating Institute - IIT - Bombay

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

Lecture 29 - Prediction of Turbulent Flows
Lecture 30 - Prediction of Turbulent Heat Transfer
Lecture 31 - Convective Mass Transfer
Lecture 32 - Stefan Flow Model
Lecture 33 - Couette Flow Model
Lecture 34 - Reynolds Flow Model
Lecture 35 - Boundary Layer Flow Model
Lecture 36 - Evaluation of g and Nw
Lecture 37 - Diffusion Mass Transfer Problems
Lecture 38 - Convective MT Couette Flow
Lecture 39 - Convective MT Reynolds Flow Model - 1
Lecture 40 - Convective MT Reynolds Flow Model - 2
Lecture 41 - Natural Convection
Lecture 42 - Diusion Jet Flames

NPTEL Video Course - Mechanical Engineering - Cryogenic Engineering

Subject Co-ordinator - Prof. M.D. Atrey

Co-ordinating Institute - IIT - Bombay

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

NPTEL Video Course - Mechanical Engineering - Advanced Strength of Materials

Subject Co-ordinator - Prof. S.K. Maiti

Co-ordinating Institute - IIT - Bombay

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

Lecture 30 - Thermal Stress Distribution in Rectangular Sheet due to Symmetric and Asymmetric Temperature Fie
Lecture 31 - Thermal Stress Distribution in Cylinders
Lecture 32 - Unsymmetrical Bending
Lecture 33 - Shear Centre
Lecture 34 - Plate Bending
Lecture 35 - Plate Bending (Continued)
Lecture 36 - Examples on Plate Bending
Lecture 37 - Approximate Solutions for Bending of Rectangular and Circular Plates
Lecture 38 - Thin Shells of Revolution
Lecture 39 - Beam on Elastic Foundation
Lecture 40 - Application of Beam on Elastic Foundation Analysis to Pressure Vessels for Calculation of Discor

NPTEL Video Course - Mechanical Engineering - Heat and Mass Transfer

Subject Co-ordinator - Prof. S.P. Sukhatme, Prof. U.N. Gaitonde

Co-ordinating Institute - IIT - Bombay

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

Lecture 30 - Boiling and Condensation - 2
Lecture 31 - Boiling and Condensation - 3
Lecture 32 - Boiling and Condensation - 4
Lecture 33 - Introduction to Mass Transfer - 1
Lecture 34 - Introduction to Mass Transfer - 2
Lecture 35 - Introduction to Mass Transfer - 3

NPTEL Video Course - Mechanical Engineering - Robotics

Subject Co-ordinator - Prof. P. Seshu, Prof. P.S. Gandhi, Prof. K. Kurien Issac, Prof. B. Seth, Prof. C. Amar

Co-ordinating Institute - IIT - Bombay

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

NPTEL Video Course - Mechanical Engineering - NOC:Optimization from Fundamentals

Subject Co-ordinator - Prof. Ankur A. Kulkarni

Co-ordinating Institute - IIT - Bombay

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

Lecture 30 - Extreme points and basic feasible solutions
Lecture 31 - Equivalence of extreme point and BFS
Lecture 32 - Equivalence of extreme point and BFS (Continued...)
Lecture 33 - Examples of Linear Programming
Lecture 34 - Weak and Strong duality
Lecture 35 - Proof of strong duality
Lecture 36 - Proof of strong duality (Continued...)
Lecture 37 - Farkas' lemma
Lecture 38 - Max-flow Min-cut problem
Lecture 39 - Shortest path problem
Lecture 40 - Complementary Slackness
Lecture 41 - Proof of complementary slackness
Lecture 42 - Tangent cones
Lecture 43 - Tangent cones (Continued...)
Lecture 44 - Constraint qualifications, Farkas' lemma and KKT
Lecture 45 - KKT conditions
Lecture 46 - Convex optimization and KKT conditions
Lecture 47 - Slater condition and Lagrangian Dual
Lecture 48 - Weak duality in convex optimization and Fenchel dual
Lecture 49 - Geometry of the Lagrangian
Lecture 50 - Strong duality in convex optimization - I
Lecture 51 - Strong duality in convex optimization - II
Lecture 52 - Strong duality in convex optimization - III
Lecture 53 - Line search methods for unconstrained optimization
Lecture 54 - Wolfe conditions
Lecture 55 - Line search algorithm and convergence
Lecture 56 - Steepest descent method and rate of convergence
Lecture 57 - Newton's method
Lecture 58 - Penalty methods
Lecture 59 - L1 and L2 Penalty methods
Lecture 60 - Augmented Lagrangian methods
Lecture 61 - Cutting plane methods
Lecture 62 - Interior point methods for linear programming
Lecture 63 - Dynamic programming: Inventory control problem
Lecture 64 - Policy and value function
Lecture 65 - Principle of optimality in dynamic programming
Lecture 66 - Principle of optimality applied to inventory control problem
Lecture 67 - Optimal control for a system with linear state dynamics and quadratic cost

NPTEL Video Course - Mechanical Engineering - NOC:Design of Mechatronic Systems

Subject Co-ordinator - Prof. Prasanna Gandhi

Co-ordinating Institute - IIT - Bombay

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

NPTEL Video Course - Mechanical Engineering - NOC:Nonlinear Adaptive Control

Subject Co-ordinator - Prof. Srikant Sukumar

Co-ordinating Institute - IIT - Bombay

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

NPTEL Video Course - Mechanical Engineering - NOC:Nonlinear Control Design

Subject Co-ordinator - Prof. Srikant Sukumar

Co-ordinating Institute - IIT - Bombay

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

Lecture 30 - Control Lyapunov functions - Part 2
Lecture 31 - Control Lyapunov functions - Part 3
Lecture 32 - Control Lyapunov functions - Part 4
Lecture 33 - Control Lyapunov functions - Part 5
Lecture 34 - Backstepping method for control design - Part 1
Lecture 35 - Backstepping method for control design - Part 2
Lecture 36 - Backstepping method for control design - Part 3
Lecture 37 - Backstepping method for control design - Part 4
Lecture 38 - Passivity based control - Part 1
Lecture 39 - Passivity based control - Part 2
Lecture 40 - Passivity based control - Part 3
Lecture 41 - Passivity in control systems - Part 1 (Prof. Antonio Loria)
Lecture 42 - Passivity in control systems - Part 2 (Prof. Antonio Loria)
Lecture 43 - Passivity in control systems - Part 3 (Prof. Antonio Loria)
Lecture 44 - Passivity in control systems - Part 4 (Prof. Antonio Loria)
Lecture 45 - Passivity based control - Part 4
Lecture 46 - Passivity based control - Part 5
Lecture 47 - Passivity based control - Part 6
Lecture 48 - Passivity based control - Part 7
Lecture 49 - Feedback Linearization - Part 1
Lecture 50 - Feedback Linearization - Part 2
Lecture 51 - Feedback Linearization - Part 3
Lecture 52 - Feedback Linearization - Part 4
Lecture 53 - Feedback Linearization - Part 5
Lecture 54 - Feedback Linearization - Part 6
Lecture 55 - Feedback Linearization - Part 6
Lecture 56 - Feedback Linearization - Part 7
Lecture 57 - Feedback Linearization - Part 8
Lecture 58 - Feedback Linearization - Part 9
Lecture 59 - Feedback Linearization - Part 10
Lecture 60 - Feedback Linearization - Part 11
Lecture 61 - Barbalat's Lemma
Lecture 62 - Application of Barbalat's Lemma
Lecture 63 - Adaptive control - Part 1
Lecture 64 - Adaptive control - Part 2
Lecture 65 - State constrained control - Part 1
Lecture 66 - State constrained control - Part 2
Lecture 67 - State constrained control - Part 3
Lecture 68 - Finite time stability - Part 1

Lecture 69 - Finite time stability - Part 2
Lecture 70 - Finite time stability - Part 3
Lecture 71 - Sliding mode control - Part 1
Lecture 72 - Sliding mode control - Part 2
Lecture 73 - Sliding mode control - Part 3

NPTEL Video Course - Mechanical Engineering - Tribology

Subject Co-ordinator - Dr. Harish Hirani

Co-ordinating Institute - IIT - Delhi

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

NPTEL Video Course - Mechanical Engineering - Computer Aided Design and Manufacturing

Subject Co-ordinator - Prof. P.V. Madhusudan Rao, Prof. Anoop Chawla

Co-ordinating Institute - IIT - Delhi

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

Lecture 30 - Modeling of Curves
Lecture 31 - Modeling of Curves
Lecture 32 - Modeling of B-Spline Curves
Lecture 33 - Modeling of B-spline Curves
Lecture 34 - Surface Modeling
Lecture 35 - Surface Modeling
Lecture 36 - Display of Curves and Surfaces
Lecture 37 - Solid Modeling
Lecture 38 - Solid Modeling
Lecture 39 - Solid Modeling Using Octrees
Lecture 40 - (Lecture Missing)
Lecture 41 - Computer Aided Design
Lecture 42 - Computer Aided Manufacturing
Lecture 43 - What is CAD/CAM
Lecture 44 - An Overview of Geometric Modeling
Lecture 45 - Parametric Cubic Curve
Lecture 46 - Parametric Bezier Curve
Lecture 47 - B-Spline Curve
Lecture 48 - Parametric Surfaces - Part-1
Lecture 49 - Parametric Surfaces - Part-2
Lecture 50 - Solid Modeling
Lecture 51 - Geometric & Product Data Exchange
Lecture 52 - Reverse Engineering

NPTEL Video Course - Mechanical Engineering - Project and Production Management

Subject Co-ordinator - Prof. Arun Kanda

Co-ordinating Institute - IIT - Delhi

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

Lecture 30 - Mathematical Models for Facility Location
Lecture 31 - Layout planning
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
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 Video Course - Mechanical Engineering - NOC:RAC Product Design

Subject Co-ordinator - Prof. Sanjeev Jain

Co-ordinating Institute - IIT - Delhi

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

NPTEL Video Course - Mechanical Engineering - NOC:Thermodynamics

Subject Co-ordinator - Prof. S.R kale

Co-ordinating Institute - IIT - Delhi

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

NPTEL Video Course - Mechanical Engineering - NOC:Solid Mechanics

Subject Co-ordinator - Prof. Ajeet Kumar

Co-ordinating Institute - IIT - Delhi

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

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Uncertainty Analysis and Experimentation

Subject Co-ordinator - Unknown

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Course Outline, Introduction
Lecture 2 - Experimentation Processes and Applications Overview
Lecture 3 - Developments in Uncertainty Analysis, Approach
Lecture 4 - Errors, Their Causes and Classification
Lecture 5 - Errors to Uncertainty via Statistics
Lecture 6 - Sources of Errors, Uncertainty Definitions
Lecture 7 - Experimentation - I
Lecture 8 - Experimentation Stages / Phases I
Lecture 9 - Experimentation Stages / Phases II
Lecture 10 - Uncertainty Analysis Processes
Lecture 11 - Instrument ans DAS
Lecture 12 - Basic procedure - I
Lecture 13 - Basic procedure - II
Lecture 14 - Evaluating systematic uncertainties
Lecture 15 - Worksheets for uncertainty in a measurement, Examples
Lecture 16 - Examples of uncertainty in a measurement
Lecture 17 - Methodologies, Multiple tests method
Lecture 18 - Single test, Basics of taylor Series Method
Lecture 19 - Sensitivity coefficient, Result uncertainty from TSM
Lecture 20 - Result uncertainty TSM: Special cases
Lecture 21 - Method selection, Worksheets for result uncertainty
Lecture 22 - Examples for result uncertainty - 1
Lecture 23 - Examples for result uncertainty - 2
Lecture 24 - Regression Introduction
Lecture 25 - Regression analysis - Linear, single variable
Lecture 26 - Correlation, Related topics
Lecture 27 - Reporting uncertainties
Lecture 28 - Validation and verification aspects, Data archiving
Lecture 29 - Course overview

NPTEL Video Course - Mechanical Engineering - NOC:Engineering Graphics and Design

Subject Co-ordinator - Prof. Naresh Varma Datla and Prof. S.R Kale

Co-ordinating Institute - IIT - Delhi

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

Lecture 30 - Working Drawing
Lecture 31 - Example Sectional View of Assembly
Lecture 32 - Computer Aided Design
Lecture 33 - Autodesk Inventor Environment
Lecture 34 - Sketching for Solid Modelling
Lecture 35 - Example 1 Extrude Hole Fillet Chamfer
Lecture 36 - Example 2 Rib Mirror
Lecture 37 - Example 3
Lecture 38 - Revolve Loft Pattern
Lecture 39 - Example 4
Lecture 40 - Example 5
Lecture 41 - Spline Sweep Shell
Lecture 42 - Example 6
Lecture 43 - Example 7
Lecture 44 - Drawing from Solid Model
Lecture 45 - Assembly with constraints
Lecture 46 - Example 8
Lecture 47 - Example 9
Lecture 48 - Example 10
Lecture 49 - Example 11
Lecture 50 - Civil and architectural drawings

NPTEL Video Course - Mechanical Engineering - NOC:Ideal Fluid Flows using Complex Analysis

Subject Co-ordinator - Prof. Amit Gupta

Co-ordinating Institute - IIT - Delhi

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

NPTEL Video Course - Mechanical Engineering - NOC:Experimental Modal Analysis

Subject Co-ordinator - Subodh V. Modak

Co-ordinating Institute - IIT - Delhi

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

Lecture 30
Lecture 31
Lecture 32
Lecture 33
Lecture 34
Lecture 35
Lecture 36
Lecture 37
Lecture 38
Lecture 39
Lecture 40

NPTEL Video Course - Mechanical Engineering - NOC:Mechanical Behavior of Polymers and Composites

Subject Co-ordinator - Dr. Naresh V Datla

Co-ordinating Institute - IIT - Delhi

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

Lecture 1 - Introduction to polymers
Lecture 2 - Polymer structure
Lecture 3 - Polymer classification
Lecture 4 - Polymer length, packing and tacticity
Lecture 5 - Glass transition temperature
Lecture 6 - Temperature effects, glassy regime
Lecture 7 - Viscoelastic, rubbery, viscous, decomposition
Lecture 8 - Relaxation and creep tests
Lecture 9 - Failure of polymers
Lecture 10 - Heaviside, Dirac delta, Laplace
Lecture 11 - Introduction to linear viscoelasticity
Lecture 12 - Phenomenological models for linear viscoelasticity
Lecture 13 - Maxwell model
Lecture 14 - Kelvin model
Lecture 15 - Three and four parameter models
Lecture 16 - Generalized Maxwell and Kelvin models
Lecture 17 - Boltzman superposition principle
Lecture 18 - Alfrey's correspondence principle
Lecture 19 - Analysis of viscoelastic bars
Lecture 20 - Analysis of viscoelastic beams
Lecture 21 - Dynamic mechanical analysis (DMA)
Lecture 22 - Dynamic mechanical thermal analysis (DMTA)
Lecture 23 - Time temperature superposition principle (TTSP)
Lecture 24 - Plastic design consideration and practices
Lecture 25 - What are composites?
Lecture 26 - Composite materials and types
Lecture 27 - Composite advantages and applications
Lecture 28 - Fabrication and other aspects of composites
Lecture 29 - 3D stress and strain components

Lecture 30 - Symmetry in stress, strain and stiffness matrix
Lecture 31 - Monoclinic, orthotropic and isotropic materials
Lecture 32 - 3D stress strain relation for orthotropic material
Lecture 33 - Plane stress: Specially orthotropic material
Lecture 34 - Plane stress: Generally orthotropic material
Lecture 35 - Lamina engineering constants
Lecture 36 - Lamina hygrothermal effects
Lecture 37 - Lamina fundamental strengths
Lecture 38 - Lamina failure criteria
Lecture 39 - Tsai-Hill and Hoffman failure criteria
Lecture 40 - Micromechanics: Assumptions, RVE
Lecture 41 - Micromechanics: Stiffness prediction
Lecture 42 - Micromechanics: Stiffness and strength
Lecture 43 - Macromechanics of laminate
Lecture 44 - Classical laminate theory
Lecture 45 - Classical laminate theory - II
Lecture 46 - Symmetric laminates, orthotropic laminates
Lecture 47 - Angle-ply, cross-ply and quasi-isotropic laminates
Lecture 48 - Hygrothermal stresses in laminates
Lecture 49 - Laminate failure
Lecture 50 - Design practices with laminates
Lecture 51 - Sandwich structures
Lecture 52 - Composites testing
Lecture 53 - Joining of composites

NPTEL Video Course - Mechanical Engineering - NOC:Data-Enabled Tribological Engineering: From Experiments to

Subject Co-ordinator - Prof. (HAG) Harish Hirani

Co-ordinating Institute - IIT - Delhi

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

NPTEL Video Course - Mechanical Engineering - Nonlinear Vibration

Subject Co-ordinator - Prof. S.K. Dwivedy

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - Theory and Practice of Rotor Dynamics

Subject Co-ordinator - Prof. Rajiv Tiwari

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - Engineering Mechanics

Subject Co-ordinator - Prof. U.S. Dixit, Dr. G. Saravana Kumar

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Direct and Oblique Impulse
Lecture 31 - Plane Kinetics of Rigid Bodies
Lecture 32 - Kinetics of a Body
Lecture 33 - Method of Momentum and Analysis of Robot Manipulator
Lecture 34 - Kinematics in 3D
Lecture 35 - Kinetics in 3D
Lecture 36 - Free Vibration
Lecture 37 - Forced Vibration Damped Undamped
Lecture 38 - Vibration of Rigid Bodies - Part 1
Lecture 39 - Vibration of Rigid Bodies - Part 2
Lecture 40 - Some Problems of Vibration

NPTEL Video Course - Mechanical Engineering - Mechanical Vibrations

Subject Co-ordinator - Prof. S.K. Dwivedy, Prof. Rajiv Tiwari

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Advanced Machining Processes

Subject Co-ordinator - Prof. Manas Das

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Nuclear Power Generation

Subject Co-ordinator - Prof. Dipankar N. Basu

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Disposal methodologies for HLW and IMW

NPTEL Video Course - Mechanical Engineering - NOC:Advances in Welding and Joining Technologies

Subject Co-ordinator - Prof. Swarup bag

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Machining and Machining Fluids

Subject Co-ordinator - Prof. Mamilla Ravi Sankar

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Mechanics of Machining

Subject Co-ordinator - Dr. Uday S. Dixit

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Principle of Hydraulic Machines and System Design

Subject Co-ordinator - Prof. Pranab K. Mondal

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Abrasive Machining and Finishing Processes

Subject Co-ordinator - Prof. Mamilla Ravi Sankar

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Theory of Rectangular Plates - Part 1

Subject Co-ordinator - Prof. Poonam Kumari

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Basic of Solid Mechanics
Lecture 2 - Enegry Principles
Lecture 3 - Classification of Plate Theories and Some Basics
Lecture 4 - Tutorial
Lecture 5 - Governing Equation for Plate - 1
Lecture 6 - Governing Equation for Plate - 2
Lecture 7 - Tutorial
Lecture 8 - Navier Solution + Levy solution
Lecture 9 - Levy Solution
Lecture 10 - Tutorial
Lecture 11 - EKM and buckling of plates
Lecture 12 - 3D Solutions
Lecture 13 - Matlab Coding + ABAQUS
Lecture 14 - Tutorial

NPTEL Video Course - Mechanical Engineering - NOC:Principles of Mechanical Measurement

Subject Co-ordinator - Prof. Dipankar N. Basu

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Basic seismic transducer
Lecture 31 - Vibro-, velo- and accelerometer
Lecture 32 - Introduction to acoustic measurement
Lecture 33 - Radioactivity and its biological effects

NPTEL Video Course - Mechanical Engineering - NOC:IC Engines and Gas Turbines

Subject Co-ordinator - Dr. Vinayak Kulkarni, Prof. Pranab K. Mondal

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Fundamental of Welding Science and Technology

Subject Co-ordinator - Prof. Pankaj Biswas

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Polymer Assisted Abrasive Finishing Processes

Subject Co-ordinator - Prof. Mamilla Ravi Sankar

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Mathematical Modeling of Manufacturing Processes

Subject Co-ordinator - Prof. Swarup bag

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Two-Phase flow with phase change in Conventional and Miniat

Subject Co-ordinator - Prof. Manmohan Pandey

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Applied Thermodynamics for Engineers

Subject Co-ordinator - Prof. Dipankar N. Basu

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Conduction and Radiation

Subject Co-ordinator - Prof. Dipankar N. Basu

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Blackbody radiation exchange
Lecture 31 - Radiation networks
Lecture 32 - Gas radiation
Lecture 33 - Radiative Transfer Equation

NPTEL Video Course - Mechanical Engineering - NOC:Steam Power Engineering

Subject Co-ordinator - Dr. Vinayak Kulkarni

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Gas Mixture
Lecture 31 - Psychrometry - 1
Lecture 32 - Psychrometry - 2
Lecture 33 - Condensers

NPTEL Video Course - Mechanical Engineering - NOC:Dynamic Behaviour of Materials

Subject Co-ordinator - Prof. Prasenjit Khanikar

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Plastic Working of Metallic Materials

Subject Co-ordinator - Prof. P.S. Robi

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Introduction
Lecture 31 - Sheet deformation process
Lecture 32 - Deformation of sheet in plane stress
Lecture 33 - Analysis of stamping
Lecture 34 - Instability in sheet metal forming
Lecture 35 - Deep drawing
Lecture 36 - Hydroforming

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Artificial Intelligence

Subject Co-ordinator - Prof. Shyamanta M. Hazarika

Co-ordinating Institute - IIT - Guwahati

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

Lecture 1 - Introduction to Artificial Intelligence
Lecture 2 - Problem Solving as State Space Search
Lecture 3 - Uninformed Search
Lecture 4 - Heuristic Search
Lecture 5 - Informed Search
Lecture 6 - Constraint Satisfaction Problems
Lecture 7 - Searching AND/OR Graphs
Lecture 8 - Game Playing
Lecture 9 - Minimax + Alpha-Beta
Lecture 10 - Introduction to Knowledge Representation
Lecture 11 - Propositional Logic
Lecture 12 - First Order Logic - I
Lecture 13 - First Order Logic - II
Lecture 14 - Inference in First Order Logic - I
Lecture 15 - Inference in First Order Logic - II
Lecture 16 - Answer Extraction
Lecture 17 - Procedural Control of Reasoning
Lecture 18 - Reasoning under Uncertainty
Lecture 19 - Bayesian Network
Lecture 20 - Decision Network
Lecture 21 - Introduction to Planning
Lecture 22 - Plan Space Planning
Lecture 23 - Planning Graph and GraphPlan
Lecture 24 - Practical Planning and Acting
Lecture 25 - Sequential Decision Problems
Lecture 26 - Making Complex Decisions
Lecture 27 - Introduction to Machine Learning
Lecture 28 - Learning Decision Trees
Lecture 29 - Linear Regression

Lecture 30 - Support Vector Machines
Lecture 31 - Unsupervised Learning
Lecture 32 - Reinforcement Learning
Lecture 33 - Learning in Neural Networks
Lecture 34 - Deep Learning

NPTEL Video Course - Mechanical Engineering - NOC:Aircraft Propulsion

Subject Co-ordinator - Dr. Vinayak Kulkarni

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Axial Flow Compressor
Lecture 31 - Examples of Axial Flow Compressor
Lecture 32 - Examples of Axial Flow Compressor
Lecture 33 - Examples of Axial Flow Compressor
Lecture 34 - Axial Turbine
Lecture 35 - Radial Turbine
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 Video Course - Mechanical Engineering - NOC:Computational Fluid Dynamics for Incompressible Flows

Subject Co-ordinator - Prof. Amaresh Dalal

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Finite volume discretization of steady diffusion equation
Lecture 31 - Finite volume discretization of unsteady diffusion equation
Lecture 32 - Finite volume discretization of steady convection-diffusion equation
Lecture 33 - Finite volume discretization of unsteady convection-diffusion equation
Lecture 34 - Convection Schemes
Lecture 35 - Solution of Navier-Stokes Equations using FVM - I
Lecture 36 - Solution of Navier-Stokes Equations using FVM - II
Lecture 37 - Boundary Conditions

NPTEL Video Course - Mechanical Engineering - NOC:Experimental Methods in Fluid Mechanics

Subject Co-ordinator - Prof. Pranab K. Mondal

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Constant temperature hot-wire anemometer, LDA
Lecture 31 - Use of PIV
Lecture 32 - Use of PIV (Continued...)
Lecture 33 - Use of PIV (Continued...)
Lecture 34 - Measurement of pitch angle
Lecture 35 - Measurement of torque by dynamometers, straingauge, transducers
Lecture 36 - Measurement of microscale flow features - I
Lecture 37 - Measurement of microscale flow features - II
Lecture 38 - Transient and Frequency response consideration
Lecture 39 - Examples
Lecture 40 - Analysis of experimental data, causes and types of experimental errors
Lecture 41 - Rejection of data
Lecture 42 - Error propagation
Lecture 43 - The Method of Least square with example

NPTEL Video Course - Mechanical Engineering - NOC:Automation in Manufacturing

Subject Co-ordinator - Dr. Shrikrishna N. Joshi

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Direction control valves
Lecture 31 - Flow control and pressure relief valves
Lecture 32 - Graphical representation of hydraulic system elements
Lecture 33 - Basic concepts and air compressors
Lecture 34 - Air treatment and pressure regulation
Lecture 35 - Graphical representation and pneumatic circuits
Lecture 36 - Computer aided manufacturing and process planning
Lecture 37 - CNC machines and interpolation
Lecture 38 - CNC Programming

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Compressible Flow

Subject Co-ordinator - Prof. Niranjan Sahoo

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Finite Element Method: Variational Methods to Computer Prog

Subject Co-ordinator - Prof. Arup Nandy, Prof. Atanu Banerjee

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Superconvergent Patch Recovery, error estimator, adaptive refinement
Lecture 31 - Solving eigenvalue problem in bar and beam, writing FEM code in MATLAB
Lecture 32 - Solving eigenvalue problem of membrane, writing FEM code in MATLAB
Lecture 33 - Solving transient problems (parabolic type)
Lecture 34 - Solving transient problems (hyperbolic type)
Lecture 35 - Solving elasticity problems in 3D using FEM, Solvers

NPTEL Video Course - Mechanical Engineering - NOC:Computational Continuum Mechanics

Subject Co-ordinator - Prof. Sachin Singh Gautam

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Introduction, Linearization Process Overview
Lecture 31 - Linearization of Internal Virtual Work and External Virtual Work
Lecture 32 - Discretization of Kinematic Quantities, Equilibrium Equations
Lecture 33 - Discretization of Linearized Equilibrium Equations
Lecture 34 - Newton Raphson Method
Lecture 35 - Line Search Method
Lecture 36 - Arc Length Method, Solved Examples
Lecture 37 - FE Formulation of Ductile Fracture in Dynamic Elasto-Plastic Contact Problem - Introduction
Lecture 38 - FE Formulation of Ductile Fracture in Dynamic Elasto-Plastic Contact Problem - Formulation
Lecture 39 - FE Formulation of Ductile Fracture in Dynamic Elasto-Plastic Contact Problem - FEM
Lecture 40 - FE Formulation of Ductile Fracture in Dynamic Elasto-Plastic Contact Problem - Results

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Convective Heat Transfer

Subject Co-ordinator - Prof. Amaresh Dalal

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Theory of Composite Shells

Subject Co-ordinator - Prof. Poonam Kumari

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Finite Element Modeling of Welding Processes

Subject Co-ordinator - Prof. Swarup bag

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Nonlinear Vibration

Subject Co-ordinator - Prof. S. K. Dwivedy

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Evolutionary Computation for Single and Multi Objective Opt

Subject Co-ordinator - Prof. Deepak Sharma

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Viscous Fluid Flow

Subject Co-ordinator - Prof. Amaresh Dalal

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - The Correlation Method by Thwaites
Lecture 31 - Separation of Boundary Layer
Lecture 32 - Example Problems
Lecture 33 - Two-dimensional Laminar Jet
Lecture 34 - Flow in the Wake of a Flat Plate
Lecture 35 - Free Shear Layer Between Two Different Streams
Lecture 36 - Derivation of Orr-Sommerfeld Equation
Lecture 37 - Viscous Stability
Lecture 38 - Inviscid Analysis
Lecture 39 - Introduction to Turbulent Flows
Lecture 40 - Derivation of Reynolds Averaged Navier-Stokes Equations
Lecture 41 - External Turbulent Flows
Lecture 42 - Integral Solution for Turbulent Boundary Layer Flow
Lecture 43 - Internal Turbulent Flow
Lecture 44 - Turbulence Modelling

NPTEL Video Course - Mechanical Engineering - NOC:Welding Application Technology

Subject Co-ordinator - Prof. Pankaj Biswas

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Additive Manufacturing Technologies

Subject Co-ordinator - Prof. Sajan Kapil

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Applied Thermodynamics

Subject Co-ordinator - Prof. Niranjan Sahoo

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Exergy Analysis and Engine Emission/Pollution
Lecture 31 - Gas Turbine Engine-Components and Thermal Circuit
Lecture 32 - Gas Turbine Performance Cycle - I
Lecture 33 - Gas Turbine Performance Cycle - II
Lecture 34 - Real Gas Turbine Performance Cycle
Lecture 35 - Aircraft Propulsion Cycle - I
Lecture 36 - Aircraft Propulsion Cycle - II
Lecture 37 - Vapour Compression Refrigeration System - I
Lecture 38 - Vapour Compression Refrigeration System - II
Lecture 39 - Absorption Refrigeration and Refrigerants
Lecture 40 - Fundamentals of Psychrometrics
Lecture 41 - Air-Conditioning Processes
Lecture 42 - Cooling Tower and Air Washers
Lecture 43 - Reciprocating Compressor - Analysis and Modelling
Lecture 44 - Multistage Compression - Analysis and Modelling

NPTEL Video Course - Mechanical Engineering - NOC:Mechanics of Fiber Reinforced Polymer Composite Structures

Subject Co-ordinator - Prof. Debabrata Chakraborty

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Prediction of Delamination
Lecture 31 - Transverse Deflection
Lecture 32 - Buckling and Free Vibration

NPTEL Video Course - Mechanical Engineering - NOC:Laser Based Manufacturing

Subject Co-ordinator - Prof. Shrikrishna N. Joshi

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Advanced Thermodynamics and Combustion

Subject Co-ordinator - Prof. Niranjan Sahoo

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Thermal Engineering: Basic and Applied

Subject Co-ordinator - Prof. Pranab K. Mondal

Co-ordinating Institute - IIT - Guwahati

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

Lecture 30 - Mass flow rate of steam in nozzle, Critical Pressure Ratio
Lecture 31 - Critical Pressure Ratio and its Physical Significance
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
Lecture 65 - Gas Turbine Unit: Combined Cycle
Lecture 66 - Problems On Gas Turbine Cycle

NPTEL Video Course - Mechanical Engineering - NOC:Mechanics of Sheet Metal Forming

Subject Co-ordinator - Prof. R Ganesh Narayanan

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Power Plant System Engineering

Subject Co-ordinator - Prof. Niranjan Sahoo

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Solidification Processing

Subject Co-ordinator - Prof. Swarup Bag

Co-ordinating Institute - IIT - Guwahati

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

NPTEL Video Course - Mechanical Engineering - Acoustics

Subject Co-ordinator - Prof. Nachiketa Tiwari

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Models of electro-mechanical-acoustic systems
Lecture 31 - Solution for a loudspeaker model
Lecture 32 - Microphones
Lecture 33 - Vibro-meter, seismometer, accelerometer, shaker table
Lecture 34 - Sound propagation in rooms, 1-D rooms, 2D rooms
Lecture 35 - Sound in 3-D rooms
Lecture 36 - Absorption coefficient, and irregular rooms
Lecture 37 - Room constant, and Sabine's coefficient
Lecture 38 - Design of a muffler
Lecture 39 - Noise in machines, basics of noise management

NPTEL Video Course - Mechanical Engineering - Advanced Machining Processes

Subject Co-ordinator - Prof. Vijay K. Jain

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Advanced Machining Processes
Lecture 31 - Advanced Machining Processes
Lecture 32 - Advanced Machining Processes
Lecture 33 - Advanced Machining Processes
Lecture 34 - Advanced Machining Processes

NPTEL Video Course - Mechanical Engineering - Biomicroelectromechanical systems

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1
Lecture 2
Lecture 3
Lecture 4
Lecture 5
Lecture 6
Lecture 7
Lecture 8
Lecture 9
Lecture 10 (same as 9)
Lecture 11
Lecture 12 (Lecture Missing)
Lecture 13
Lecture 14
Lecture 15
Lecture 16
Lecture 17
Lecture 18
Lecture 19
Lecture 20
Lecture 21
Lecture 22
Lecture 23
Lecture 24
Lecture 25
Lecture 26
Lecture 27
Lecture 28
Lecture 29

Lecture 30
Lecture 31
Lecture 32
Lecture 33
Lecture 34
Lecture 35
Lecture 36
Lecture 37
Lecture 38
Lecture 39
Lecture 40

NPTEL Video Course - Mechanical Engineering - Computer Aided Engineering Design

Subject Co-ordinator - Dr. Anupam Saxena

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30
Lecture 31
Lecture 32
Lecture 33
Lecture 34
Lecture 35
Lecture 36
Lecture 37
Lecture 38
Lecture 39
Lecture 40

NPTEL Video Course - Mechanical Engineering - Mathematical Methods in Engineering and Science

Subject Co-ordinator - Dr. Bhaskar Dasgupta

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - Dynamics of Machines

Subject Co-ordinator - Prof. Amitabha Ghosh

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Equivalent viscous damping
Lecture 31 - Dynamics of Machines
Lecture 32 - Systems with two degree of freedom
Lecture 33 - Tuned Vibration Absorber
Lecture 34 - Design of Vibration Absorbers
Lecture 35 - Flexibility Matrix Influence Coeff
Lecture 36 - Forced Vibration of multiple
Lecture 37 - Forced Vibration of Multiple degrees
Lecture 38 - Vibration of Continuous Systems
Lecture 39 - Vibration of Continuous Systems
Lecture 40 - Vibration of Beams
Lecture 41 - Rayleigh's method
Lecture 42 - Rayleigh-Ritz Method
Lecture 43 - Vibration Measurement
Lecture 44 - Vibration Measurement Types of Pickups

NPTEL Video Course - Mechanical Engineering - Finite Element Method

Subject Co-ordinator - Prof. C.S. Upadhyay

Co-ordinating Institute - IIT - Kanpur

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

Module 1 - Lecture 1
Module 1 - Lecture 2
Module 1 - Lecture 3
Module 2 - Lecture 1
Module 2 - Lecture 2
Module 2 - Lecture 3
Module 2 - Lecture 4
Module 3 - Lecture 1
Module 3 - Lecture 2
Module 3 - Lecture 3
Module 4 - Lecture 1
Module 4 - Lecture 2
Module 4 - Lecture 3
Module 5 - Lecture 1
Module 5 - Lecture 2
Module 5 - Lecture 3
Module 6 - Lecture 1
Module 6 - Lecture 2
Module 6 - Lecture 3
Module 7 - Lecture 1
Module 7 - Lecture 2
Module 7 - Lecture 3
Module 7 - Lecture 4
Module 8 - Lecture 1
Module 8 - Lecture 2
Module 8 - Lecture 3
Module 9 - Lecture 1
Module 9 - Lecture 2
Module 9 - Lecture 3

Module 10 - Lecture 1
Module 10 - Lecture 2
Module 11 - Lecture 1
Module 11 - Lecture 2
Module 12 - Lecture 1
Module 13 - Lecture 1
Module 13 - Lecture 2
Module 14 - Lecture 1
Module 14 - Lecture 2

NPTEL Video Course - Mechanical Engineering - Kinematics of Machines

Subject Co-ordinator - Prof. Ashok K Mallik

Co-ordinating Institute - IIT - Kanpur

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

Module 10 - Lecture 3
Module 11 - Lecture 1
Module 11 - Lecture 2
Module 11 - Lecture 3
Module 12 - Lecture 1
Module 12 - Lecture 2
Module 12 - Lecture 3
Module 13 - Lecture 1
Module 13 - Lecture 2
Module 13 - Lecture 3

NPTEL Video Course - Mechanical Engineering - Advanced manufacturing process for micro sytem fabrication

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lab session 1 - Advanced manufacturing process for micro sytem fabrication
Lab session 2 - EDM Micro Machening
Lab session 3 - EDM Micro Drilling
Lab session 4 - Laser Machening Process
Lab session 5 - Vaccume Assisted Forming
Lab session 6 - Vaccume Forming
Lab session 7 - Photolithiography
Lab session 8 - Replication part 1
Lab session 9 - Replication part 2
Lab session 10 - PCB Making
Lecture 1
Lecture 2
Lecture 3
Lecture 4
Lecture 5
Lecture 6
Lecture 7
Lecture 8
Lecture 9
Lecture 10
Lecture 11
Lecture 12
Lecture 13
Lecture 14
Lecture 15
Lecture 16
Lecture 17
Lecture 18
Lecture 19

Lecture 20
Lecture 21
Lecture 22
Lecture 23
Lecture 24
Lecture 25
Lecture 26
Lecture 27
Lecture 28

NPTEL Video Course - Mechanical Engineering - Engineering Drawing (Dr. Anupam Saxena)

Subject Co-ordinator - Dr. Anupam Saxena

Co-ordinating Institute - IIT - Kanpur

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

Lab Session 1
Lab Session 2
Lab Session 3
Lab Session 4
Lab Session 5
Lab Session 6
Lab Session 7
Lab Session 8
Lab Session 9
Lab Session 10
Lab Session 11
Lab Session 12
Lecture 1 - Technical Arts 101
Lecture 2 - Technical Arts 101
Lecture 3 - Technical Arts 101
Lecture 4 - Technical Arts 101
Lecture 5 - Technical Arts 101
Lecture 6 - Technical Arts 101
Lecture 7 - Technical Arts 101
Lecture 8 - Technical Arts 101
Lecture 9 - Technical Arts 101
Lecture 10 - Technical Arts 101
Lecture 11 - Technical Arts 101
Lecture 12 - Technical Arts 101
Lecture 13 - Technical Arts 101
Lecture 14 - Technical Arts 101
Lecture 15 - Technical Arts 101
Lecture 16 - Technical Arts 101
Lecture 17 - Technical Arts 101

Lecture 18 - Technical Arts 101
Lecture 19 - Technical Arts 101
Lecture 20 - Technical Arts 101
Lecture 21 - Technical Arts 101
Lecture 22 - Technical Arts 101
Lecture 23 - Technical Arts 101
Lecture 24 - Technical Arts 101
Lecture 25 - Technical Arts 101
Lecture 26 - Technical Arts 101
Lecture 27 - Technical Arts 101
Lecture 28 - Technical Arts 101

NPTEL Video Course - Mechanical Engineering - NOC:BioMEMS and Microsystems

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

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
Lecture 32 - Lecture-26
Lecture 33 - Lecture-27
Lecture 34 - Lecture-28
Lecture 35 - Lecture-29
Lecture 36 - Lecture-30
Lecture 37 - Lecture-31
Lecture 38 - Lecture-32
Lecture 39 - Lecture-33
Lecture 40 - Review lecture 23,24,25
Lecture 41 - Review lecture 26,27,28
Lecture 42 - Review lecture 29 to 33

NPTEL Video Course - Mechanical Engineering - NOC:Manufacturing Systems Technology

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30
Lecture 31
Lecture 32
Lecture 33
Lecture 34
Lecture 35
Lecture 36
Lecture 37
Lecture 38
Lecture 39
Lecture 40
Lecture 41
Lecture 42
Lecture 43
Lecture 44
Lecture 45
Lecture 46
Lecture 47
Lecture 48

NPTEL Video Course - Mechanical Engineering - NOC:Manufacturing Systems Technology - Part II

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Joint configuration systems of Robot

NPTEL Video Course - Mechanical Engineering - NOC:Basics of Finite Element Analysis

Subject Co-ordinator - Prof. Nachiketa Tiwari

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - One dimensional heat transfer
Lecture 31 - 1D-Heat conduction with convective effects
Lecture 32 - Euler-Bernoulli beam
Lecture 33 - Interpolation functions for Euler-Bernoulli beam
Lecture 34 - Finite element equations for Euler-Bernoulli beam
Lecture 35 - Assembly equations for Euler-Bernoulli beam
Lecture 36 - Boundary conditions for Euler-Bernoulli beam
Lecture 37 - Shear deformable beams
Lecture 38 - Finite element formulation for shear deformable beams
Lecture 39 - Finite element formulation for shear deformable beams
Lecture 40 - Equal interpolation but reduced integration element
Lecture 41 - Eigenvalue problems
Lecture 42 - Eigenvalue problems
Lecture 43 - Introduction to time dependent problems
Lecture 44 - Spatial approximation
Lecture 45 - Temporal approximation for parabolic problems
Lecture 46 - Temporal approximation for parabolic problems
Lecture 47 - Temporal approximation for hyperbolic problems
Lecture 48 - Explicit and implicit method, diagonalization of mass matrix, closure

NPTEL Video Course - Mechanical Engineering - NOC:Basics of Noise and Its Measurements

Subject Co-ordinator - Prof. Nachiketa Tiwari

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Fourier Transform - Continuation
Lecture 31 - Discrete Fourier Transform (DFT)
Lecture 32 - Discrete Fourier Transform (DFT) - Continuation
Lecture 33 - DFT - Calculating Frequencies and Padding
Lecture 34 - DFT - Influence of Duration and Sampling frequency on resolution
Lecture 35 - FFT and Inverse FFT
Lecture 36 - Considerations while deciding instrumentation
Lecture 37 - Considerations while selecting instruments for noise measurements
Lecture 38 - Measuring impedance through two microphone method
Lecture 39 - Designing an impedance measurement tube
Lecture 40 - Octave band analysis
Lecture 41 - Calculating results in octave bands
Lecture 42 - Weighting
Lecture 43 - Short time Fourier transforms (STFT)
Lecture 44 - Spectrograms
Lecture 45 - Reverberation time
Lecture 46 - Anechoic rooms
Lecture 47 - STC, NRC and sound attenuation
Lecture 48 - Reverberant rooms

NPTEL Video Course - Mechanical Engineering - NOC:Manufacturing Process Technology - Part I

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Nature and Property of Materials

Subject Co-ordinator - Prof. Bishakh Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Numerical
Lecture 31 - Numerical
Lecture 32 - Numerical
Lecture 33 - Optical Properties
Lecture 34 - Optical Fiber
Lecture 35 - Thermal Properties
Lecture 36 - Numerical
Lecture 37 - Electric Properties - I
Lecture 38 - Electric Properties - II
Lecture 39 - Magnetic Properties
Lecture 40 - Laboratory demonstration

NPTEL Video Course - Mechanical Engineering - NOC:Manufacturing Process Technology - Part II

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Basics of Finite Element Analysis - II

Subject Co-ordinator - Prof. Nachiketa Tiwari

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Principles of Vibration Control

Subject Co-ordinator - Prof. Bishakh Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Acoustics

Subject Co-ordinator - Prof. Nachiketa Tiwari

Co-ordinating Institute - IIT - Kanpur

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

Lecture 1 - Lesson 1 - Course Overview
Lecture 2 - Lesson 2 - Introduction
Lecture 3 - Lesson 3 - Nature Of Sound
Lecture 4 - Lesson 4 - The Decibel scale
Lecture 5 - Lesson 5 - Key Terms In Acoustics
Lecture 6 - Lesson 6 - Adding Decibels
Lecture 7 - Lesson 1 - Important Mathematical Concepts-Complex Algebra
Lecture 8 - Lesson 2 - Important Mathematical Concepts-Complex Time Signals
Lecture 9 - Lesson 3 - Important Mathematical Concepts-Transfer Function
Lecture 10 - Lesson 4 - Important Mathematical Concepts-Pole Zero Plot
Lecture 11 - Lesson 5 - Important Mathematical Concepts - Bode Plot For Simple Pole
Lecture 12 - Lesson 6 - Important Mathematical Concepts - Bode Plot For Simple Zero
Lecture 13 - Lesson 1 - Bode Plots (Magnitude) for Complex Transfer Functions
Lecture 14 - Lesson 2 - Momentum Equation for 1-D Sound Propagation
Lecture 15 - Lesson 3 - Continuity Equation for 1-D Sound Propagation
Lecture 16 - Lesson 4 - Gas Law for 1-D Sound Propagation
Lecture 17 - Lesson 5 - 1-D Wave Equation
Lecture 18 - Lesson 6 - Solution for 1-D Wave Equation
Lecture 19 - Lesson 1 - Waveguide
Lecture 20 - Lesson 2 - Transmission Line Equations - Part I
Lecture 21 - Lesson 3 - Transmission Line Equations - Part II
Lecture 22 - Lesson 4 - Transmission Line Equations - Part III
Lecture 23 - Lesson 5 - Transmission Line Equations - Part IV
Lecture 24 - Lesson 6 - Transmission Line Equations - Part V
Lecture 25 - Lesson 1 - Instantaneous Power
Lecture 26 - Lesson 2 - Instantaneous Power in a L-R Circuit
Lecture 27 - Lesson 3 - Power Factor, and Acoustic Power
Lecture 28 - Lesson 4 - Power Flow into an Infinitely Long Tube
Lecture 29 - Lesson 5 - Point Sources of Sound

Lecture 30 - Lesson 6 - Relations for Outward Travelling Spherical Acoustic Wave
Lecture 31 - Lesson 1 - Specific Acoustic Impedance for a Closed Tube
Lecture 32 - Lesson 2 - Specific Acoustic Impedance for an Open Tube and an Infinitely Long Tube
Lecture 33 - Lesson 3 - Specific Acoustic Impedance for a Tube with Imperfect Termination
Lecture 34 - Lesson 4 - KundtÂ s Tube
Lecture 35 - Lesson 5 - Volume Velocity
Lecture 36 - Lesson 6 - Comparison of Impedances for a Radially Propagating Wave and a Planar Wave
Lecture 37 - Lesson 1 - Interference of sound sources - Part I
Lecture 38 - Lesson 2 - Interference of sound sources - Part II
Lecture 39 - Lesson 3 - Interference of sound sources - Part III
Lecture 40 - Lesson 4 - Interference of sound sources - Part IV
Lecture 41 - Lesson 5 - Directivity
Lecture 42 - Lesson 6 - Complex power, pressure and velocity for a spherical source
Lecture 43 - Lesson 1 - Noise reduction - Mass Attenuation Method
Lecture 44 - Lesson 2 - Noise Reduction - Pressure Ratio
Lecture 45 - Lesson 3 - Noise Reduction - Velocity of Wall
Lecture 46 - Lesson 4 - 3 Media Problem - Introduction
Lecture 47 - Lesson 5 - 3 Media Problem - Apply Boundary Conditions
Lecture 48 - Lesson 6 - 3 Media Problem - Special cases
Lecture 49 - Lesson 1 - Mufflers
Lecture 50 - Lesson 2 - Designing of Reactive Mufflers
Lecture 51 - Lesson 3 - Designing of Dissipative Mufflers
Lecture 52 - Lesson 4 - Time and Frequency Domain Representation of a Signal
Lecture 53 - Lesson 5 - Fourier Series
Lecture 54 - Lesson 6 - Fourier Series
Lecture 55 - Lesson 1 - Fourier Transform
Lecture 56 - Lesson 2 - Fourier Transform
Lecture 57 - Lesson 3 - Fourier Transform
Lecture 58 - Lesson 4 - Discrete Fourier Transform (DFT)
Lecture 59 - Lesson 5 - Discrete Fourier Transform (DFT)
Lecture 60 - Lesson 6 - Discrete Fourier Transform (DFT)
Lecture 61 - Lesson 1 - Measuring Sound Signals
Lecture 62 - Lesson 2 - Microphones
Lecture 63 - Lesson 3 - Microphones
Lecture 64 - Lesson 4 - Weighting
Lecture 65 - Lesson 5 - Loudness
Lecture 66 - Lesson 6 - Loudness
Lecture 67 - Lesson 1 - Octave Band Analysis - Part I
Lecture 68 - Lesson 2 - Octave Band Analysis Â Part II

Lecture 69 - Lesson 3 - Octave Band Analysis Â Part III
Lecture 70 - Lesson 4 - Reverberation Time
Lecture 71 - Lesson 5 - Calculation of Reverberation Time and Sound Transmission Class (STC)
Lecture 72 - Lesson 6 - Noise Reduction Coefficient (NRC)

NPTEL Video Course - Mechanical Engineering - NOC:Heat Treatment and Surface Hardening - II

Subject Co-ordinator - Dr. Kallol Mondal

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Implication of Avramiâ s equation with example on excel spreadsheet
Lecture 31 - Experimental verification of Avrami Equation
Lecture 32 - Linear regression (least squares) method to find the value of n and k in Avrami equation
Lecture 33 - In this lecture, method to determine the goodness of fit has been explained. Procedure to estima
Lecture 34 - Stereology and quantitative metallography - I
Lecture 35 - Stereology and quantitative metallography - II
Lecture 36 - Grain size measurements methods
Lecture 37 - Statistical tools for analysis and reporting of obtained data with examples
Lecture 38 - Evolution of TTT and CCT diagram from f vs. t plots
Lecture 39 - TTT, CCT continue and hardenability of steel
Lecture 40 - Importance of heat treatment practices in real life (with examples)

NPTEL Video Course - Mechanical Engineering - NOC:Phase Transformation in Materials

Subject Co-ordinator - Dr. Krishanu Biswas

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Growth rate for dendrite formation
Lecture 31 - Alloy solidification
Lecture 32 - Alloy solidification (Continued...)
Lecture 33 - Eutectic
Lecture 34 - Eutectic
Lecture 35 - Solidification of casting / ingot
Lecture 36 - Precipitation hardenable alloy
Lecture 37 - Precipitation age- hardening alloy (Continued...)
Lecture 38 - Age hardening alloy
Lecture 39 - Eutectoid transformation
Lecture 40 - Eutectoid transformation (Continued....)
Lecture 41 - Eutectoid transformation in steel (Continued...)
Lecture 42 - Martensite
Lecture 43 - Martensite (Continued...)
Lecture 44 - Martensite (Continued...) and TTT curves
Lecture 45 - TTT diagram
Lecture 46 - Recovery, Recrystallization and Grain growth
Lecture 47 - Recovery
Lecture 48 - Recrystallization
Lecture 49 - Recrystallization (Continued...)
Lecture 50 - Introduction to spinodal decomposition

NPTEL Video Course - Mechanical Engineering - NOC:Manufacturing of Composites

Subject Co-ordinator - Prof. J. Ramkumar

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Applied Ergonomics

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Work Systems
Lecture 31 - Measures of Productivity
Lecture 32 - Productivity Measurement
Lecture 33 - Work Study
Lecture 34 - Motion and time study
Lecture 35 - (Missing)
Lecture 36 - (Missing)
Lecture 37 - (Missing)
Lecture 38 - (Missing)
Lecture 39 - (Missing)
Lecture 40 - Industrial accidents
Lecture 41 - Human Errors
Lecture 42 - Workers compensation laws
Lecture 43 - Organisation Ergonomics - Part 1
Lecture 44 - Organisation Ergonomics - Part 2
Lecture 45 - Job Satisfaction
Lecture 46 - Worker behavior

NPTEL Video Course - Mechanical Engineering - NOC:Sustainability through Green Manufacturing Systems - An App

Subject Co-ordinator - Dr. Deepu Philip, Dr. Amandeep Singh

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Noise Management and Control

Subject Co-ordinator - Prof. Nachiketa Tiwari

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Volume velocity - I
Lecture 31 - Interference of 1-D spherically propagating sound waves - I
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
Lecture 40 - Noise Source
Lecture 41 - Noise Source
Lecture 42 - Noise Source
Lecture 43 - Noise Source
Lecture 44 - Noise Source
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
Lecture 65 - Acoustic barriers - III
Lecture 66 - Helmholtz resonator - I

NPTEL Video Course - Mechanical Engineering - NOC:Design Practice

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Axiomatic Design
Lecture 31 - Introduction to group technology
Lecture 32 - Failure Mode Effect Analysis

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Composites

Subject Co-ordinator - Prof. Nachiketa Tiwari

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Failure modes of unidirectional composite
Lecture 31 - Failure of Unidirectional Lamina
Lecture 32 - Minimum Volume Fraction and Critical Volume Fraction
Lecture 33 - Example based on Failure of Composite Material
Lecture 34 - Example based on Minimum and Critical Volume Fraction
Lecture 35 - Transverse Modulus of Unidirectional Composite
Lecture 36 - Halpin-Tsai Relation for Transverse Modulus
Lecture 37 - Transverse modulus of unidirectional composites
Lecture 38 - Transverse strength of unidirectional composites
Lecture 39 - Poissonâ s ratio of unidirectional composites
Lecture 40 - Failure modes of composite materials
Lecture 41 - Failure modes of composite materials
Lecture 42 - Other properties
Lecture 43 - Concept of Tensor
Lecture 44 - Stress Transformation (Two Dimensional)
Lecture 45 - Analysis of Specially Orthotropic Lamina
Lecture 46 - Analysis of Generally Orthotropic Lamina
Lecture 47 - Transformation of Engineering Constants - Part I
Lecture 48 - Transformation of Engineering Constants - Part II
Lecture 49 - Variation of elastic constants with respect to fiber orientation for generally orthotropic lamir
Lecture 50 - Generally orthotropic lamina
Lecture 51 - Generalized Hookeâ s law for anisotropic materials
Lecture 52 - Generalized Hookeâ s law for anisotropic materials
Lecture 53 - Elastic constants for Specially orthotropic materials
Lecture 54 - Elastic constants for Specially orthotropic materials in plane stress
Lecture 55 - Relation Betweeen Engineering Constants and Elements of Stiffness and Compliance Matrices - Part
Lecture 56 - Relation Betweeen Engineering Constants and Elements of Stiffness and Compliance Matrices - Part
Lecture 57 - Stress Strain Relations for A Lamina With Arbitrary Orientation - Part I
Lecture 58 - Stress- Strain Relation for A Lamina With Arbitrary Orientation - Part II
Lecture 59 - Strength of An Orthotropic Lamina
Lecture 60 - Importance of Sign of Shear Stress in context of Strength of A Unidirectional Lamina
Lecture 61 - Strain displacement relations for a laminate
Lecture 62 - Stress-strain relations for individual layers of a laminate
Lecture 63 - Resultant forces and moments
Lecture 64 - Relations between force and moment resultants and mid-plane strains and curvatures
Lecture 65 - Physical significance of extensional stiffness matrix [A], coupling matrix [B] and bending stiff
Lecture 66 - Lamination sequence (standard laminate code)
Lecture 67 - Calculation of A, B and D Matrices.
Lecture 68 - Simplification of Stiffness Matrices - Part I

NPTEL Video Course - Mechanical Engineering - NOC:Product Design and Manufacturing

Subject Co-ordinator - Dr. Amandeep Singh, Prof. J. Ramkumar

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Patent - Part 1
Lecture 31 - Patent - Part 2
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 Video Course - Mechanical Engineering - NOC:Phase Equilibria in Materials - Nature and Properties of Ma

Subject Co-ordinator - Dr. Ashish Garg

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Phase Diagrams for non-Ferrous Alloys
Lecture 31 - Method of measuring Phase diagram
Lecture 32 - Methods of measuring phase diagram (Continued...)
Lecture 33 - Methods of measuring phase diagram
Lecture 34 - Ternary Phase Diagram
Lecture 35 - Ternay Phase Diagram (Continued...)
Lecture 36 - Ternary system with two phases
Lecture 37 - Ternary system with three phases
Lecture 38 - Ternary phase diagram with 4 phases
Lecture 39 - Application of Phases diagrams
Lecture 40 - Summary of Course

NPTEL Video Course - Mechanical Engineering - NOC:Advanced Composites

Subject Co-ordinator - Prof. Nachiketa Tiwari

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Engineering Metrology

Subject Co-ordinator - Dr. Amandeep Singh, Prof. J. Ramkumar

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Pressure measurements - Part 2
Lecture 31 - Strain measurements - Part 1
Lecture 32 - Strain measurements - Part 2
Lecture 33 - Optical measurements and Nanometrology - Part 1
Lecture 34 - Optical measurements and Nanometrology - Part 2
Lecture 35 - Optical measurements and Nanometrology - Part 3
Lecture 36 - Statistics in Metrology, an intoduction - Part 1
Lecture 37 - Statistics in Metrology, an intoduction - Part 2
Lecture 38 - Data and scales in measurements
Lecture 39 - Discrete and continuous data
Lecture 40 - Statistics for metrology, fundamental concepts - Part 1
Lecture 41 - Statistics for metrology, fundamental concepts - Part 2
Lecture 42 - Statistics for metrology, fundamental concepts - Part 3
Lecture 43 - Probability distributions for estimating measurement
Lecture 44 - Normal distribution
Lecture 45 - Statistics for proportions
Lecture 46 - Chi square distribution, and Data outlier detection
Lecture 47 - Quality Control, introduction
Lecture 48 - Quality Control, control charts for variables
Lecture 49 - Quality Control, control charts for attributes
Lecture 50 - Quality Control, critical aspects
Lecture 51 - 3D measurements, Coordinate Measuring Machine (CMM)
Lecture 52 - Laboratory demonstration, Coordinate Measuring Machine (CMM))

NPTEL Video Course - Mechanical Engineering - NOC:Smart Materials and Intelligent System Design

Subject Co-ordinator - Prof. Bisakh Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Design Practice-II

Subject Co-ordinator - Dr. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Fused Deposition Modeling
Lecture 31 - LAB demonstration of Fused Deposition Modelling Techniques
Lecture 32 - LAB demonstrtion of Fused Deposition Modelling Process
Lecture 33
Lecture 34
Lecture 35
Lecture 36
Lecture 37

NPTEL Video Course - Mechanical Engineering - NOC:Rapid Manufacturing

Subject Co-ordinator - Prof. J. Ramkumar

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Beam Deposition processes
Lecture 31 - Materials in Rapid Manufacturing - Part 1
Lecture 32 - Materials in Rapid Manufacturing - Part 2
Lecture 33 - Post-processing concerns - Part 1
Lecture 34 - Post-processing concerns - Part 2
Lecture 35 - Product costing for Rapid Manufacturing - Part 1
Lecture 36 - Product costing for Rapid Manufacturing - Part 2
Lecture 37 - Rapid Product Development, CAD/CAM - Part 1
Lecture 38 - Rapid Product Development, CAD/CAM - Part 2
Lecture 39 - Rapid Product Development, CAD/CAM - Part 3
Lecture 40 - Rapid Product Development, CAE and CIM
Lecture 41 - Rapid Product Development, Technomatix, Plant Simulation 10 - Part 1
Lecture 42 - Rapid Product Development, Technomatix, Plant Simulation 10 - Part 2
Lecture 43 - Rapid Product Development, Technomatix, Plant Simulation 10 - Part 3
Lecture 44 - Rapid Manufactiuring, case studies

NPTEL Video Course - Mechanical Engineering - NOC:Turbulent Combustion: Theory and Modelling

Subject Co-ordinator - Prof. Ashoke De

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Turbulence
Lecture 31 - Turbulence
Lecture 32 - Turbulence
Lecture 33 - Turbulence
Lecture 34 - Turbulence
Lecture 35 - Turbulence
Lecture 36 - Turbulence
Lecture 37 - Turbulence
Lecture 38 - Turbulence
Lecture 39 - Turbulence
Lecture 40 - Turbulence
Lecture 41 - Turbulence
Lecture 42 - Turbulence
Lecture 43 - Turbulence
Lecture 44 - Turbulence
Lecture 45 - Turbulence
Lecture 46 - Turbulent Combustion
Lecture 47 - Turbulent Combustion
Lecture 48 - Turbulent Combustion
Lecture 49 - Turbulent Combustion
Lecture 50 - Turbulent Combustion
Lecture 51 - Turbulent Combustion
Lecture 52 - Turbulent Combustion
Lecture 53 - Turbulent Combustion
Lecture 54 - Turbulent Combustion
Lecture 55 - Turbulent Combustion
Lecture 56 - Turbulent Combustion
Lecture 57 - Turbulent Combustion
Lecture 58 - Multiphase Combustion
Lecture 59 - Multiphase Combustion
Lecture 60 - Multiphase Combustion

NPTEL Video Course - Mechanical Engineering - NOC:Manufacturing Automation

Subject Co-ordinator - Prof. Sounak Kumar Choudhury

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Computer Integrated Manufacturing

Subject Co-ordinator - Prof. J. Ramkumar, Prof. Amandeep Singh

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Machining Science

Subject Co-ordinator - Prof. Sounak Kumar Choudhury

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Foundations of Cognitive Robotics

Subject Co-ordinator - Prof. Bishakh Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Robotics

Subject Co-ordinator - Prof. Ashish Dutta

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Muffler Acoustics - Application to Automotive Exhaust Noise

Subject Co-ordinator - Prof. Akhilesh Mimani

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Elements of Solar Energy Conversion

Subject Co-ordinator - Prof. Jishnu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30
Lecture 31
Lecture 32
Lecture 33
Lecture 34
Lecture 35

NPTEL Video Course - Mechanical Engineering - NOC:Manufacturing Processes - Casting and Joining

Subject Co-ordinator - Prof. Sounak Kumar Choudhury

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Computational Fluid Dynamics and Heat Transfer

Subject Co-ordinator - Prof. Gautam Biswas

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Production Technology: Theory and Practice

Subject Co-ordinator - Prof. Sounak Kumar Choudhury

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Laboratory Demonstration/Hands-On Practice - 7
Lecture 31 - Laboratory Demonstration/Hands-On Practice - 8
Lecture 32 - Laboratory Demonstration/Hands-On Practice - 9
Lecture 33 - Laboratory Demonstration/Hands-On Practice - 10

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Turbomachinery

Subject Co-ordinator - Prof. Subrata Sarkar

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Robot Motion Planning

Subject Co-ordinator - Prof. Ashish Dutta

Co-ordinating Institute - IIT - Kanpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Metal Additive Manufacturing

Subject Co-ordinator - Prof. Amandeep Singh Oberoi, Prof. Janakranjan Ramkumar

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Reverse Engineering in MAM - Part 1
Lecture 31 - Reverse Engineering in MAM - Part 2
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 Video Course - Mechanical Engineering - NOC:Conduction and Convection: Fundamentals and Applications

Subject Co-ordinator - Prof. Gautam Biswas

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30
Lecture 31
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Lecture 37
Lecture 38
Lecture 39

NPTEL Video Course - Mechanical Engineering - NOC:Advanced Robotics

Subject Co-ordinator - Prof. Ashish Dutta

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30

NPTEL Video Course - Mechanical Engineering - NOC:Applied Numerical Methods

Subject Co-ordinator - Prof. Malay K. Das

Co-ordinating Institute - IIT - Kanpur

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

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Lecture 124
Lecture 125
Lecture 126
Lecture 127

NPTEL Video Course - Mechanical Engineering - NOC:Social Innovation in Industry 4.0

Subject Co-ordinator - Prof. Janakranjan Ramkumar, Prof. Amandeep Singh Oberoi

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30
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Lecture 52

NPTEL Video Course - Mechanical Engineering - NOC:Engineering Thermodynamics in Hindi

Subject Co-ordinator - Prof. Jayant K. Singh

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30
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Lecture 55

NPTEL Video Course - Mechanical Engineering - NOC:Advanced Machining Processes (2024)

Subject Co-ordinator - Prof. Shantanu Bhattacharya

Co-ordinating Institute - IIT - Kanpur

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

Lecture 30 - Lab Session-II: Electro-discharge Machining Process - I
Lecture 31 - Lab Session-III: Electro-discharge Machining Process - II
Lecture 32 - Lab Session-IV: Laser Beam Machining
Lecture 33 - Lab Session-V: Photolithiography

NPTEL Video Course - Mechanical Engineering - Computational Fluid Dynamics (Prof. S. Chakraborty)

Subject Co-ordinator - Prof. S. Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Fundamentals of Industrial Oil Hydraulics and Pneumatics

Subject Co-ordinator - Prof. R.N. Maiti

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Machinery fault diagnosis and signal processing

Subject Co-ordinator - Prof. A.R. Mohanty

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Solar Energy Technology

Subject Co-ordinator - Prof. V.V. Satyamurty

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Technology of Surface Coating

Subject Co-ordinator - Prof. A.K. Chattopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Vibration of Structures

Subject Co-ordinator - Prof. A. Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Wave Propagation in Beams
Lecture 31 - Dynamics of Curved Beams
Lecture 32 - Vibrations of Rings and Arches
Lecture 33 - Dynamics of Membranes
Lecture 34 - Vibrations of Rectangular Membrane
Lecture 35 - Vibrations of Circular Membrane
Lecture 36 - Special Problems in Membrane Vibrations
Lecture 37 - Dynamics of Plates
Lecture 38 - Vibrations of Rectangular Plates
Lecture 39 - Vibrations of Circular Plates
Lecture 40 - Special Problems in Plate Vibrations

NPTEL Video Course - Mechanical Engineering - Basic Thermodynamics

Subject Co-ordinator - Prof. S.K. Som

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Design of Machine Elements I

Subject Co-ordinator - Prof. G. Chakraborty, Prof. B. Maiti, Prof. S.K. Roychowdhury

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Manufacturing Processes II

Subject Co-ordinator - Prof. S. Paul, Prof. A.B. Chattopadhyay, Prof. A.K. Chattopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Refrigeration and Air Conditioning

Subject Co-ordinator - Prof. M. Ramgopal, Prof. R.C. Arora

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Fluid Mechanics

Subject Co-ordinator - Prof. S.K. Som

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Introduction to Fluid Machines and Compressible Flow

Subject Co-ordinator - Prof. S.K. Som

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Effects of Area Variation on Properties in an Isentropic Flow
Lecture 31 - Choking in a Converging Nozzle
Lecture 32 - Isentropic Flow through Convergent - Divergent Duct
Lecture 33 - Normal Shock - Part I
Lecture 34 - Normal Shock - Part II
Lecture 35 - Normal Shock - Part III
Lecture 36 - Normal Shock - Part IV
Lecture 37 - Normal Shock - Part V
Lecture 38 - Oblique Shock - Part I
Lecture 39 - Oblique Shock - Part II
Lecture 40 - Introduction to Expansion Wave and Prandtl Meyer Flow

NPTEL Video Course - Mechanical Engineering - Introduction to Fluid Mechanics and Fluid Engineering

Subject Co-ordinator - Prof. S. Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - Micro fluidics

Subject Co-ordinator - Prof. S. Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Conduction and Convection Heat Transfer

Subject Co-ordinator - Prof. S.K. Som, Prof. S. Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Vibrations of Structures

Subject Co-ordinator - Prof. A. Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Fluid Machines

Subject Co-ordinator - Prof. S.K. Som

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Computer numerical control (CNC) of machine tools and proce

Subject Co-ordinator - Prof. Asimava Roy Choudhury

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction to computer control Â role of computers in automation
Lecture 2 - Introduction (Continued...) - binary logic and logic gates
Lecture 3 - Classification of Computer numerical control (CNC) Â Point to point and continuous control
Lecture 4 - Classification (Continued...) - Closed loop and open loop control
Lecture 5 - Tutorial involving simple calculations on different aspects of CNC controls
Lecture 6 - Questions, MCQ Discussions on Motors, Encoders, Decoders and Programming Practice
Lecture 7 - Stepper motors, Permanent magnet DC motors
Lecture 8 - Binary circuits and decoders
Lecture 9 - Tachogenerator, printed circuit motors, Encoders
Lecture 10 - Programming Practice - I
Lecture 11 - Programming Practice - II
Lecture 12 - Computer Aided Offline Programming
Lecture 13 - Interpolators - Linear
Lecture 14 - Interpolators - Curvilinear
Lecture 15 - Questions on Programming and Interpolation
Lecture 16 - 3-D Machining - Basic Concepts
Lecture 17 - Curved Surface Geometry
Lecture 18 - Cutter Path Generation for Curved Surfaces
Lecture 19 - Cutter Path Generation (Concluding Part) and Current Status - CNC Machining and Related Processe
Lecture 20 - Questions and Discussions on Curved Surface Machining

NPTEL Video Course - Mechanical Engineering - NOC:Non Traditional Abrasive Machining Processes - Ultrasonic,

Subject Co-ordinator - Prof. Asimava Roy Choudhury

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Fluid Mechanics

Subject Co-ordinator - Dr. Suman Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Lagrangian and Eulerian Approach, Types of fluid flow
Lecture 2 - Streamlines, Streakline and Pathline
Lecture 3 - Acceleration of fluid flow
Lecture 4 - Deformation and Conservation of mass of fluid a element
Lecture 5 - Angular deformation of a fluid element, vorticity and streamfunction and velocity potential
Lecture 6 - Eulerâ s equation
Lecture 7 - Bernoulliâ s equation - Part I
Lecture 8 - Kinematic viscosity, Reynolds number
Lecture 9 - Non-Newtonian fluids
Lecture 10 - Problems and Solutions
Lecture 11 - Problems and Solutions
Lecture 12 - Surface Tension - Part I
Lecture 13 - Surface Tension - Part II
Lecture 14 - Governing equation of fluid statics
Lecture 15 - Manometers
Lecture 16 - Force on a surface immersed in fluid - Part I
Lecture 17 - Force on a surface immersed in fluid - Part II
Lecture 18 - Force on a surface immersed in fluid - Part III, Stability of solid bodies in fluid - Part I
Lecture 19 - Stability of solid bodies in fluid - Part II
Lecture 20 - Fluid under rigid body motion
Lecture 21 - Lagrangian and Eulerian approaches
Lecture 22 - Concept of different flow lines
Lecture 23 - Acceleration of fluid flow
Lecture 24 - Deformation of fluid elements - Part I
Lecture 25 - Derivation of continuity equation
Lecture 26 - Problems and Solutions
Lecture 27 - Deformation of fluid elements - Part II
Lecture 28 - Deformation of fluid elements - Part III
Lecture 29 - Stream Function

Lecture 30 - Circulation, Velocity Potential
Lecture 31 - Eulerâ s equation
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
Lecture 37
Lecture 38
Lecture 39
Lecture 40
Lecture 41
Lecture 42
Lecture 43
Lecture 44
Lecture 45
Lecture 46
Lecture 47
Lecture 48
Lecture 49
Lecture 50
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 Video Course - Mechanical Engineering - NOC:Spur and Helical Gear Cutting

Subject Co-ordinator - Prof. Asimava Roy Choudhury

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Laws of Thermodynamics

Subject Co-ordinator - Prof. Suman Chakraborty, Prof. S.K. Som

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Energy Conservation and Waste Heat Recovery

Subject Co-ordinator - Prof. PK Das

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Heat Exchanger (Continued...)
Lecture 31 - Heat Exchanger (Continued...)
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
Lecture 65
Lecture 66
Lecture 67
Lecture 68 - Corrigendum

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Mechanical Micro Machining

Subject Co-ordinator - Prof. Ajay M Sidpara

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Machinery Fault Diagnosis and Signal Processing

Subject Co-ordinator - Prof. Amiya Ranjan Mohanty

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Overview Of Transducers For Cbm
Lecture 31 - Accelerometers
Lecture 32 - Vibration Monitoring
Lecture 33 - Rotational Speed Measurements
Lecture 34 - Basics of Noise
Lecture 35 - Noise Monitoring
Lecture 36 - Introduction to Faults in Rotating Machines
Lecture 37 - Unbalance Detection
Lecture 38 - Field Balancing
Lecture 39 - Misalignment
Lecture 40 - Crack and Looseness
Lecture 41 - Journal and Anti-Friction Bearings
Lecture 42 - Gears
Lecture 43 - Pumps and Cavitation
Lecture 44 - IC Engines
Lecture 45 - Machinery Diagnostic Chart
Lecture 46 - Principles of Motor Current Signature Analysis
Lecture 47 - Faults in Electrical Machines
Lecture 48 - Thermography
Lecture 49 - Wear Debris Analysis
Lecture 50 - Oil Analysis
Lecture 51 - Ultrasonics
Lecture 52 - Eddy Current and Acoustic Emission
Lecture 53 - Radiography, Dye Penetrant Tests
Lecture 54 - Tool Condition Monitoring
Lecture 55 - Experimental Modal Analysis
Lecture 56 - Introduction to Failure Analysis
Lecture 57 - Railway Locomotive Noise and Vibration Monitoring
Lecture 58 - Paper Mill Vibration Monitoring
Lecture 59 - Overview of CBM facilities at IIT Kharagpur
Lecture 60 - Future of Condition based Monitoring

NPTEL Video Course - Mechanical Engineering - NOC:Metal Cutting and Machine Tools

Subject Co-ordinator - Prof. Asimava Roy Choudhury

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Gear and Gear Unit Design - Theory and Practice

Subject Co-ordinator - Prof. Rathindranath Maiti

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 1 - Introduction - Motivation and Theme of the Course
Lecture 2 - Laws of Gearing, Kinematics and Geometry - Part I
Lecture 3 - Laws of Gearing, Kinematics and Geometry - Part II
Lecture 4 - Involute Toothed Gear- Properties and Terminology
Lecture 5 - Tutorial
Lecture 6 - Involute Straight Tooth Spur Gear
Lecture 7 - Helical Tooth Spur Gear and Loads on Gear Shaft
Lecture 8 - Design of Bevel Gear
Lecture 9 - Crossed Helical Gear - I
Lecture 10 - Crossed Helical Gear - II and Worm Gear
Lecture 11 - Gear Unit Design - Selection of Stage Ratios, Pinion and Gear Teeth Numbers
Lecture 12 - Gear Unit Design - First Stage Pinion and Gear Design- I (Module on Beam Strength Basis)
Lecture 13 - Gear Unit Design - Failure of Gear Tooth (Probable Dynamic Load and Wear Load Capacity)
Lecture 14 - Gear Unit Design - 1st. Stage Pinion and Gear Design-II (Probable Dynamic Load and Wear Load Ca
Lecture 15 - Gear Unit Design - 1st. Layout (After Gear Design)
Lecture 16 - Bearing Arrangement - Gear Box Shafts
Lecture 17 - Bearing Load Calculation - Intermediate Shaft
Lecture 18 - Bearing Selection and Introduction to Shaft Design Verification
Lecture 19 - Design Verification of Gear Box Shafts
Lecture 20 - Development (Layout) of Intermediate Shaft
Lecture 21 - Development (Layout) of Input Shaft and Integral Pinion
Lecture 22 - Development (Layout) of Output Shaft and 2nd. Stage (Output) Gear
Lecture 23 - Development (Layout) of Output Shaft (Continued...), Loads on Shaft and Bearings
Lecture 24 - Output Shaft-Bearing Lives
Lecture 25 - Design Verification of Output Shaft
Lecture 26 - Design Verification of Input Shaft (including Bearing Life Estimation)
Lecture 27 - Finalizing Design including the Sizes of the Keys
Lecture 28 - Development of Plan and Elevation of Gear Reduction Unit - I
Lecture 29 - Development of Plan and Elevation of Gear Reduction Unit - II

Lecture 30 - Development of Plan and Elevation of Gear Reduction Unit - III
Lecture 31
Lecture 32
Lecture 33 - Involute Spur Gear Tooth Correction
Lecture 34 - Involute Spur Gear Tooth Correction
Lecture 35 - Involute Spur Gear Tooth Correction
Lecture 36 - Involute Spur Gear Tooth Correction
Lecture 37 - Involute Spur Gear Tooth Correction
Lecture 38 - Tooth Tip Interference, Avoidance and Contact Ratio in Involute Internal Gearing
Lecture 39
Lecture 40
Lecture 41
Lecture 42
Lecture 43
Lecture 44
Lecture 45 - Live Session

NPTEL Video Course - Mechanical Engineering - NOC:Traditional and Non-Traditional Optimization Tools

Subject Co-ordinator - Prof. Dilip Kumar Pratihar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - A Practical Optimization Problem (Continued...)
Lecture 31 - A Practical Optimization Problem (Continued...)
Lecture 32 - A Practical Optimization Problem (Continued...)
Lecture 33 - A Practical Optimization Problem (Continued...)
Lecture 34 - A Practical Optimization Problem (Continued...)
Lecture 35 - A Practical Optimization Problem (Continued...)
Lecture 36 - A Practical Optimization Problem (Continued...)
Lecture 37 - Genetic Algorithm as Evolution Tool
Lecture 38 - Genetic Algorithm as Evolution Tool (Continued...)
Lecture 39 - Genetic Algorithm as Evolution Tool (Continued...)
Lecture 40 - Genetic Algorithm as Evolution Tool (Continued...)
Lecture 41 - Genetic Algorithm as Evolution Tool (Continued...)
Lecture 42 - Genetic Algorithm as Evolution Tool (Continued...)
Lecture 43 - Summary 1
Lecture 44 - Summary 2
Lecture 45 - Summary 3

NPTEL Video Course - Mechanical Engineering - NOC:Mechanism and Robot Kinematics

Subject Co-ordinator - Dr. Anirvan Das Gupta

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Heat Exchangers: Fundamentals and Design Analysis

Subject Co-ordinator - Prof. Prasanta Kr Das, Prof. Somnath Roy

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Plate fin heat exchanger
Lecture 31 - Plate fin heat exchanger
Lecture 32 - Plate fin heat exchanger
Lecture 33 - Plate fin heat exchanger
Lecture 34 - Plate fin heat exchanger
Lecture 35 - Plate fin heat exchanger
Lecture 36 - Phase change heat exchangers
Lecture 37 - Phase change heat exchangers (Continued...)
Lecture 38 - Surface Condenser
Lecture 39 - Surface Condenser (Continued...)
Lecture 40 - Surface Condenser (Continued...)
Lecture 41 - Surface Condenser (Continued...)
Lecture 42 - In tube condensation
Lecture 43 - Heat pipes and Heat pipe heat exchangers
Lecture 44 - Heat pipes and Heat pipe heat exchangers (Continued...)
Lecture 45 - Heat pipes and Heat exchangers
Lecture 46 - Heat pipes and Heat exchangers (Continued...)
Lecture 47 - Micro Heat Exchanger Introduction
Lecture 48 - Micro scale Heat Transfer
Lecture 49 - Micro scale Heat Transfer (Continued...)
Lecture 50 - Micro Channel
Lecture 51 - Micro Heat Exchanger
Lecture 52 - Regenerators
Lecture 53 - Fixed Bed Regenerator Analysis
Lecture 54 - Design and Simulation of Regenerator (Fixed Bed)
Lecture 55 - Fixed Bed Regenerator (Numerical)
Lecture 56 - Fixed Bed Regenerator (Numerical) (Continued...)
Lecture 57 - Fouling in Heat Exchangers
Lecture 58 - Fouling in Heat Exchangers (Continued...)
Lecture 59 - Fouling in Heat Exchangers (Continued...)
Lecture 60 - Direct Contact heat exchanger
Lecture 61 - Direct Contact heat exchanger (Continued...)
Lecture 62 - Heat exchanger network synthesis
Lecture 63 - Heat exchanger network
Lecture 64 - Heat exchanger network (Continued...)
Lecture 65 - Heat Exchanger Testing
Lecture 66 - Heat Exchanger Testing (Continued...)

NPTEL Video Course - Mechanical Engineering - NOC:Robotics

Subject Co-ordinator - Prof. Dilip Kumar Pratihar

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Computational Fluid Dynamics

Subject Co-ordinator - Prof. S. Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Gaussian elemination and LU Decomposition methods
Lecture 31 - Illustrative example of elemination method
Lecture 32 - Tri-Diagonal Matrix Algorithm (TDMA)
Lecture 33 - Elimination Methods
Lecture 34 - Elimination Methods
Lecture 35 - Iteration methods
Lecture 36 - Generalized analysis of Iteration method
Lecture 37 - Further discussion on Iterative methods
Lecture 38 - Illustrative examples of Iterative methods
Lecture 39 - Gradient Search based methods
Lecture 40 - Steepest descent method (Continued...)
Lecture 41 - Conjugate gradient method
Lecture 42 - Convection diffusion equation
Lecture 43 - Central difference scheme applied to convection-diffusion equation
Lecture 44 - Upwind scheme
Lecture 45 - Illustrative examples
Lecture 46 - Exact solution of 1-D steady state convection diffusion equation (Continued...)
Lecture 47 - Exponential scheme
Lecture 48 - Generalized convection diffusion formulation
Lecture 49 - 2-D convection diffusion problem
Lecture 50 - False (numerical) diffusion scheme and the QUICK scheme
Lecture 51 - Discretization of Navier Stokes equation
Lecture 52 - Discretization of Navier Stokes equation (Continued...)
Lecture 53 - Concept of staggered grid
Lecture 54 - SIMPLE algorithm
Lecture 55 - Salient features of SIMPLE algorithm
Lecture 56 - Illustrative examples on the use of SIMPLE algorithm
Lecture 57 - SIMPLER algorithm
Lecture 58 - Illustrative examples of SIMPLER algorithm
Lecture 59 - What is there in implementing a CFD Code
Lecture 60 - Some representative case studies

NPTEL Video Course - Mechanical Engineering - NOC:Concepts of Thermodynamics

Subject Co-ordinator - Prof. Aditya Bandopadhyay, Prof. Suman Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - First Law for Unsteady Problems - Examples (Continued...)
Lecture 31 - First Law for Unsteady Problems - Examples (Continued...)
Lecture 32 - Supplementary Lecture
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
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
Lecture 44 - Entropy Change in closed system
Lecture 45 - Supplementary Lecture
Lecture 46 - Supplementary Lecture
Lecture 47 - Entropy Transport for a flow process
Lecture 48 - Entropy Transport for flow process
Lecture 49 - Entropy Transport for flow process
Lecture 50 - Entropy Transport for flow process
Lecture 51 - Entropy Transport for flow process
Lecture 52 - Supplementary Lecture
Lecture 53 - Exergy (Availability)
Lecture 54 - Exergy (Availability) (Continued...)
Lecture 55 - Exergy Analysis
Lecture 56 - Exergy Analysis
Lecture 57 - Thermodynamic Relationships
Lecture 58 - Thermodynamic Relationships (Continued...)
Lecture 59 - Otto Cycle
Lecture 60 - Diesel Cycle
Lecture 61 - Example Problems
Lecture 62 - Brayton Cycle
Lecture 63 - Carnot Cycle and Rankine Cycle
Lecture 64 - Carnot Cycle and Rankine Cycle (Continued...)
Lecture 65 - Vapour Compression Refrigeration Cycle
Lecture 66 - Review of Learning Concepts
Lecture 67 - Supplementary Lecture
Lecture 68 - Supplementary Lecture

NPTEL Video Course - Mechanical Engineering - NOC:Electronic Packaging and Manufacturing

Subject Co-ordinator - Prof. A Bhattacharya

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Thermal Management 9
Lecture 31 - Shock and Vibration - 1
Lecture 32 - Shock and Vibration - 2
Lecture 33 - Shock and Vibration - 3
Lecture 34 - Shock and Vibration - 4
Lecture 35 - Electronic Packaging Reliability - 1
Lecture 36 - Electronic Packaging Reliability - 2
Lecture 37 - Electronic Packaging Reliability - 3
Lecture 38 - Electronic Packaging Reliability - 4
Lecture 39 - Power Electronics Packaging
Lecture 40 - Special Topics

NPTEL Video Course - Mechanical Engineering - NOC:Kinematics of Mechanisms and Machines

Subject Co-ordinator - Prof. A. Dasgupta

Co-ordinating Institute - IIT - Kharagpur

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

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

Subject Co-ordinator - Prof. Suman Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Conduction and Convection Heat Transfer (Prof. S. Chakrabor

Subject Co-ordinator - Prof. S. Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Transient Conduction: Semi - Infinite Slab - I
Lecture 31 - Transient Conduction: Semi - Infinite Slab - II
Lecture 32 - Introduction to Convection
Lecture 33 - Review of Fluid Mechanics - I
Lecture 34 - Review of Fluid Mechanics - II
Lecture 35 - Review of Fluid Mechanics - III
Lecture 36 - Review of Fluid Mechanics - IV
Lecture 37 - Review of Fluid Mechanics - V
Lecture 38 - Energy Conservation Equation - I
Lecture 39 - Energy Conservation Equation - II
Lecture 40 - Energy Conservation Equation - III
Lecture 41 - Thermal Boundary Layer - I
Lecture 42 - Thermal Boundary Layer - II
Lecture 43 - Energy Integral Equation - I
Lecture 44 - Energy Integral Equation - II
Lecture 45 - Internal Forced Convection - 1
Lecture 46 - Internal Forced Convection - 2
Lecture 47 - Internal Forced Convection - 3
Lecture 48 - Internal Forced Convection - 4
Lecture 49 - Internal Forced Convection - 5
Lecture 50 - Internal Forced Convection - 6
Lecture 51 - Viscous Dissipation - 1
Lecture 52 - Viscous Dissipation - 2
Lecture 53 - Natural Convection - 1
Lecture 54 - Natural Convection - 2
Lecture 55 - Natural Convection - 3
Lecture 56 - Natural Convection - 4
Lecture 57 - Condensation - I
Lecture 58 - Condensation - II
Lecture 59 - Boiling
Lecture 60 - Heat Exchangers - I
Lecture 61 - Heat Exchangers - II
Lecture 62 - Heat Exchangers - III
Lecture 63 - Heat Exchangers - IV
Lecture 64 - Heat Exchangers - V
Lecture 65 - Problems on Heat Exchangers

NPTEL Video Course - Mechanical Engineering - NOC:Advanced Concepts in Fluid Mechanics

Subject Co-ordinator - Prof. Aditya Bandopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Potential Flow (Continued...)
Lecture 31 - Potential Flow (Continued...)
Lecture 32 - Potential Flow (Continued...)
Lecture 33 - Potential Flow (Continued...)
Lecture 34 - Stokes Flow past a Sphere
Lecture 35 - Stokes Flow past a Sphere (Continued...)
Lecture 36 - Stokes Flow past a Sphere (Continued...)
Lecture 37 - Lubrication Theory
Lecture 38 - Lubrication Theory (Continued...)
Lecture 39 - Lubrication Theory (Continued...)
Lecture 40 - Thin Film Dynamics
Lecture 41 - Thin Film Dynamics (Continued...)
Lecture 42 - Thin Film Dynamics (Continued...)
Lecture 43 - Thin Film Dynamics (Continued...)
Lecture 44 - Thin Film Dynamics (Continued...)
Lecture 45 - Thin Film Dynamics (Continued...)
Lecture 46 - Thin Film Dynamics (Continued...)
Lecture 47 - Thin Film Dynamics (Continued...)
Lecture 48 - Compressible Flows
Lecture 49 - Compressible Flows (Continued...)
Lecture 50 - Compressible Flows (Stagnation Properties)
Lecture 51 - Compressible Flows (Stagnation Properties, Variable Area)
Lecture 52 - Compressible Flows (Variable Area)
Lecture 53 - Compressible Flows (Variable Area)
Lecture 54 - Compressible Flows (Normal Shock)
Lecture 55 - Compressible Flows (Normal Shock) (Continued...)
Lecture 56 - Compressible Flows (Converging Nozzle)
Lecture 57 - Compressible Flows (Converging Diverging Nozzle)
Lecture 58 - Compressible Flows (Converging Diverging Nozzle) (Continued...)
Lecture 59 - Compressible Flows with Friction

NPTEL Video Course - Mechanical Engineering - NOC:High Performance Computing for Scientists and Engineers

Subject Co-ordinator - Prof. Somnath Roy

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Introduction to GPGPU and CUDA
Lecture 31 - Introduction to GPGPU and CUDA (Continued...)
Lecture 32 - Introduction to GPGPU and CUDA (Continued...)
Lecture 33 - Introduction to GPGPU and CUDA (Continued...)
Lecture 34 - Introduction to CUDA programming
Lecture 35 - Introduction to CUDA programming (Continued...)
Lecture 36 - Thread execution in CUDA program - scheduling and memory access
Lecture 37 - Thread execution in CUDA program (Continued...)
Lecture 38 - Matrix multiplications in CUDA
Lecture 39 - OpenACC programming for GPU-s
Lecture 40 - Hybrid parallelization and exascale computing

NPTEL Video Course - Mechanical Engineering - NOC:Engineering Drawing and Computer Graphics

Subject Co-ordinator - Prof. Rajaram Lakkaraju

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Tools in Scientific Computing

Subject Co-ordinator - Prof. Aditya Bandopadhyay

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Advanced Dynamics

Subject Co-ordinator - Prof. Anirvan DasGupta

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Biomechanics of Joints and Orthopaedic Implants

Subject Co-ordinator - Prof. Sanjay Gupta

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Elements of Metal Cutting, Machine tools, Gear Cutting and

Subject Co-ordinator - Unknown

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Finite Element Method

Subject Co-ordinator - Prof. Biswanath Banerjee, Prof. Amit Shaw

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Analysis of Euler-Bernoulli Beam (Computer Implementation)
Lecture 31 - Analysis of Plane Frame (Computer Implementation)
Lecture 32 - Introduction to FEM in 2D
Lecture 33 - Continuity and Completeness
Lecture 34 - Shape Functions
Lecture 35 - Numerical Integration (Gaussian Quadrature)
Lecture 36 - Gaussian Quadrature in two dimension
Lecture 37 - Weak Form
Lecture 38 - Example
Lecture 39 - Iso-Parametric Formulation
Lecture 40 - Example with Quadrilateral Element
Lecture 41 - Computer Implementation
Lecture 42 - 2D Elasticity and Weak Form
Lecture 43 - Weak Form and Matrix Formulation
Lecture 44 - Weak Form to Matrix Form
Lecture 45 - Problems
Lecture 46 - Thermoelastic Problem
Lecture 47 - Torsion
Lecture 48 - Triangular Elements
Lecture 49 - Triangular Elements (Continued...)
Lecture 50 - Examples and Computer Implementation
Lecture 51 - Examples and Computer Implementation (Continued...)
Lecture 52 - Shear Locking
Lecture 53 - Selective reduced Integration and Modes of Q4 Element
Lecture 54 - Incompatible Elements
Lecture 55 - Nearly Incompressible Material
Lecture 56
Lecture 57 - B-Bar Method
Lecture 58 - Different Elements
Lecture 59 - Iso-parametric Formulation and Guass Quadrature
Lecture 60 - Closure

NPTEL Video Course - Mechanical Engineering - NOC:Product Engineering and Design Thinking

Subject Co-ordinator - Prof. Pranab K Dan, Prof. Prabir Sarkar

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - A Primer on Design for Quality: Robust and Reliability Engineering
Lecture 31 - Tolerance Design: Taguchi Robust Engineering
Lecture 32 - Complexity Mitigation in Multidisciplinary, System: Concurrent Engineering Precepts
Lecture 33 - Design Thinking steps
Lecture 34 - Design Thinking Methodologies and Tools
Lecture 35 - Frugal Engineering-A Disruptive Innovation Paradigm in Product Design and Development
Lecture 36 - Design-Driven Innovation
Lecture 37 - User interface and Experience (UI/UX) Design in Product Engineering
Lecture 38 - Industrial Design: Aesthetics and Ergonomics
Lecture 39 - Design Thinking in Industrial Design - Case Studies
Lecture 40 - Product Engineering'- Led Technology Entrepreneurship

NPTEL Video Course - Mechanical Engineering - NOC:Microfluidics and Nanofluidics

Subject Co-ordinator - Prof. Suman Chakraborty

Co-ordinating Institute - IIT - Kharagpur

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

Lecture 30 - Microelectric Fluid Flow through Microchannel
Lecture 31 - Fluid Flow through Deformable Microchanels
Lecture 32 - Fluid Flow through Deformable Microchanels (Continued...)
Lecture 33 - Lubrication Theory
Lecture 34 - Lubrication Theory (Continued...)
Lecture 35 - Lubrication Theory (Continued...)
Lecture 36 - Lubrication Theory (Continued...)
Lecture 37 - Lubrication Theory (Continued...)
Lecture 38 - Lubrication Theory - 2 Dimensional Problems
Lecture 39 - Unsteady Flows
Lecture 40 - Unsteady Flows (Continued...)
Lecture 41 - Unsteady Flows: Stoke's 1st problem (Continued...)
Lecture 42 - Unsteady Flows: Stoke's 1st problem (Continued...)
Lecture 43 - Unsteady Flows: Stoke's 2nd Problem
Lecture 44 - Unsteady Flows: Stoke's 2nd Problem (Continued...)
Lecture 45 - Unsteady Flows: Stoke's 2nd Problem (Continued...)
Lecture 46 - Stokes Flow Past a Sphere
Lecture 47 - Stokes Flow Past a Sphere
Lecture 48 - Stokes Flow Past a Sphere - The Drag Force
Lecture 49 - Surface Tension and Its Implications in Mircrofluidics
Lecture 50 - Equilibrium of a Droplet
Lecture 51 - Equilibrium of a Droplet (Continued...)
Lecture 52 - Capillary Rise
Lecture 53 - Capillary Filling Dynamics
Lecture 54 - Capillary Filling Dynamics (Continued...)
Lecture 55 - Capillary Filling Dynamics (Continued...)
Lecture 56 - Capillary Filling Dynamics (Continued...)
Lecture 57 - Factors affecting Capillary and Wetting
Lecture 58 - Electrowetting
Lecture 59 - Slip Boundary Condition
Lecture 60 - Apparent Slip
Lecture 61 - Thin Film Flows
Lecture 62 - Thin Film Flows (Continued...)
Lecture 63 - Electrokinetics and Electric Double Layer
Lecture 64 - Equilibrium within Electrical Double Layer Poisson Boltzmann model
Lecture 65 - Poisson - Nernst - Plank Model
Lecture 66 - Maxwell Stress and Electroosmosis
Lecture 67 - Electroosmosis
Lecture 68 - Electrophoresis and Streaming Potential

NPTEL Video Course - Mechanical Engineering - NOC:Industrial Robotics: Theories for Implementation

Subject Co-ordinator - Dr. Arun Dayal Udai

Co-ordinating Institute - IIT-ISM Dhanbad

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

NPTEL Video Course - Mechanical Engineering - NOC:Cryogenic Hydrogen Technology

Subject Co-ordinator - Prof. Indranil Ghosh

Co-ordinating Institute - IIT - Kharagpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Industrial Hydraulics and Automation

Subject Co-ordinator - Prof. Niranjan Kumar, Prof. Ajit Kumar

Co-ordinating Institute - IIT-ISM Dhanbad

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

NPTEL Video Course - Mechanical Engineering - Advanced Gas Dynamics

Subject Co-ordinator - Dr. Rinku Mukherjee

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Design and Optimization of Energy systems

Subject Co-ordinator - Prof. C. Balaji

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Dichotomous search
Lecture 31 - Fibonacci search method
Lecture 32 - Reduction ratio of Fibonacci search method
Lecture 33 - Introduction to multi-variable optimization
Lecture 34 - The Conjugate gradient method
Lecture 35 - The Conjugate gradient method (Continued.)
Lecture 36 - Linear programming
Lecture 37 - Dynamic programming
Lecture 38 - Genetic Algorithms
Lecture 39 - Genetic Algorithms (Continued.)
Lecture 40 - Simulated Annealing and Summary

NPTEL Video Course - Mechanical Engineering - Engineering Fracture Mechanics

Subject Co-ordinator - Prof. K. Ramesh

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Experimental Stress Analysis

Subject Co-ordinator - Prof. K. Ramesh

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Rocket Propulsion

Subject Co-ordinator - Prof. K. Ramamurthi

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Analysis of Gas Generator and Staged Combustion Cycles and Introduction to Injectors
Lecture 31 - Injectors, Cooling of Chamber and Mixture Ratio Distribution
Lecture 32 - Efficiencies due to Mixture Ratio Distribution and Incomplete Vaporization
Lecture 33 - Pumps and Turbines; Propellant Feed System at Zero â gâ • Conditions
Lecture 34 - Review of Liquid Bi-propellant Rockets and Introduction to Mono-propellant Rockets
Lecture 35 - Introduction to Hybrid Rockets and a Simple Illustration of Combustion Instability in Liquid Pro
Lecture 36 - Combustion Instability in Solid Propellant and Liquid Propellant Rockets â Bulk and Wave Modes
Lecture 37 - Wave modes of Oscillation
Lecture 38 - Mechanisms Causing Instabilities and Strategies for Avoiding Combustion Instability
Lecture 39 - Electric and Magnetic Fields and the Electrostatic Thruster
Lecture 40 - Electrical Thrusters
Lecture 41 - Advances in Rocket Propulsion

NPTEL Video Course - Mechanical Engineering - Advanced Finite Elements Analysis

Subject Co-ordinator - Dr. R. Krishnakumar

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Advanced Finite Elements Analysis

NPTEL Video Course - Mechanical Engineering - Advanced Operations Research

Subject Co-ordinator - Prof. G. Srinivasan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Fundamentals of Operations Research

Subject Co-ordinator - Prof. G. Srinivasan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Introduction to Finite Element Method

Subject Co-ordinator - Dr. R. Krishnakumar

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Introduction to Finite Element Method
Lecture 31 - Introduction to Finite Element Method
Lecture 32 - Introduction to Finite Element Method
Lecture 33 - Introduction to Finite Element Method

NPTEL Video Course - Mechanical Engineering - Mechanical Measurements and Metrology

Subject Co-ordinator - Prof. Shunmugam M. S, Prof. S.P. Venkateshan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Principles of Mechanical Measurements

Subject Co-ordinator - Prof. R. Raman

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Spray Theory and Applications

Subject Co-ordinator - Prof. Mahesh Panchagnula, Dr. Paul E. Sojka

Co-ordinating Institute - IIT - Madras | Purdue University

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

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

NPTEL Video Course - Mechanical Engineering - Gas Dynamics and Propulsion

Subject Co-ordinator - Prof. V. Babu

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Microfluidics

Subject Co-ordinator - Dr. Ashis Kumar Sen

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Convective Heat Transfer

Subject Co-ordinator - Dr. Arvind Pattamatta, Prof. Ajit K. Kolar

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Introduction to Explosions and Explosion Safety

Subject Co-ordinator - Prof. K. Ramamurthi

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Metrology

Subject Co-ordinator - Dr. K. Sadashivappa

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Basics of interferometry
Lecture 31 - Interferometers
Lecture 32 - Introduction to comparators, Mechanical comparators
Lecture 33 - Electrical and electronic comparators, Optical comparators
Lecture 34 - Pneumatic comparators
Lecture 35 - Geometrical tests on lathe
Lecture 36 - Geometrical tests on pillar type drilling machine
Lecture 37 - Universal measuring machine (UMM) and Coordinate measuring machine (CMM)
Lecture 38 - CMM probes and CMM software
Lecture 39 - Feature measurement using CMM, Laser vision
Lecture 40 - In-process gauging and control
Lecture 41 - Stage position metrology
Lecture 42 - Micro and Nano stages, Nano technology instrumentation
Lecture 43 - Optical system design
Lecture 44 - Complex opto- mechanical assemblies, Metrology testing and certification services

NPTEL Video Course - Mechanical Engineering - NOC:Engineering Mechanics Statics and Dynamics

Subject Co-ordinator - Prof. Mahesh Panchagnula

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Impulse / Momentum - Example 2
Lecture 31 - Impulse / Momentum - Example 3
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 Video Course - Mechanical Engineering - NOC:Foundation of Computational Fluid Dynamics

Subject Co-ordinator - Dr.S.Vengadesan

Co-ordinating Institute - IIT - Madras

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

Week 6 - Module-3
Week 6 - Module-4
Week 6 - Module-5
Week 7 - Module-1
Week 7 - Module-2
Week 7 - Module-3
Week 7 - Module-4
Week 7 - Module-5
Week 8 - Module-1
Week 8 - Module-2
Week 8 - Module-3
Week 8 - Module-4
Week 8 - Module-5
Week 8 - Module-6
Conclusion

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Boundary Layers

Subject Co-ordinator - Dr. Rinku Mukherjee

Co-ordinating Institute - IIT - Madras

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

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
Lecture 32 - BL Separation with Pressure-Gradient - I
Lecture 33 - BL Separation with Pressure Gradient - II
Lecture 34 - Effect of Prandtl Number in Thermal BL - I
Lecture 35 - Effect of Prandtl Number in Thermal BL - II
Lecture 36 - Effect of Prandtl Number in Thermal BL - III
Lecture 37 - Effect of Dissipation in Thermal BL - I
Lecture 38 - Effect of Dissipation in Thermal BL - II
Lecture 39 - Effect of Dissipation in Thermal BL - III
Lecture 40 - Similarity Solutions to Thermal BL - An Overview

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Gas Dynamics

Subject Co-ordinator - Prof.A. Sameen

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Introduction to normal shocks
Lecture 31 - Normal shock relations - 1
Lecture 32 - Normal shock relations - 2
Lecture 33 - Rankine-Hugoniot equation
Lecture 34 - Discussion on Normal Shocks - 1
Lecture 35 - Discussion on Normal Shocks - 2
Lecture 36 - Normal shocks in C-D nozzles
Lecture 37 - Normal shocks in C-D nozzles (Continued...)
Lecture 38 - Moving Normal Shocks
Lecture 39 - Discussion on moving normal shocks
Lecture 40 - Oblique shocks
Lecture 41 - Oblique shock relations
Lecture 42 - Discussion on oblique shocks
Lecture 43 - Reflection of oblique shocks
Lecture 44 - Discussion on reflection of oblique shocks
Lecture 45 - Prandtl-Meyer flow
Lecture 46 - Prandtl-Meyer flow (Continued...)
Lecture 47 - Discussion on Prandtl-Meyer expansion
Lecture 48 - Shock Polar diagram and Prandtl-Meyer relation for Oblique shocks

NPTEL Video Course - Mechanical Engineering - NOC:Experimental Stress Analysis:An Overview

Subject Co-ordinator - Prof. K. Ramesh

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to Stress Analysis Â Analytical and Numerical Approaches
Lecture 2 - Introduction to Stress Analysis - Experimental Approaches
Lecture 3 - Optical Methods Work as Optical Computers
Lecture 4 - Basic information provided by various experimental methods
Lecture 5 - Visual Appreciation of Field Information - Part 1
Lecture 6 - Visual Appreciation of Field Information - Part 2
Lecture 7 - Visual Appreciation of Field Information - Part 3
Lecture 8 - Visual Appreciation of Field Information - Part 4
Lecture 9 - Visual Appreciation of Field Information - Part 5
Lecture 10 - Completeness of a Numerical Solution
Lecture 11 - Principle of Strain Gauges
Lecture 12 - Overview of Strain Gauge Measurements
Lecture 13 - Elegance of Photoelasticity
Lecture 14 - Introduction to Photoelasticity
Lecture 15 - Different Polariscopes
Lecture 16 - Principles of MoirÃ©
Lecture 17 - Introduction to MoirÃ©
Lecture 18 - Introduction to Brittle Coatings
Lecture 19 - Introduction to Holography
Lecture 20 - Introduction to Hologram Interferometry
Lecture 21 - Introduction to Double exposure hologram interferometry
Lecture 22 - Introduction to Speckle Methods
Lecture 23 - Introduction to Speckle Interferometry Techniques
Lecture 24 - Introduction to TSA and DIC
Lecture 25 - Introduction to Caustics
Lecture 26 - Introduction to Coherent Gradient Sensor
Lecture 27 - Naming of Experimental Methods
Lecture 28 - Fringe Patterns - Richness of Qualitative Information
Lecture 29 - Key technologies that have influenced Experimental Mechanics

Lecture 30 - Multiscale analysis and trends in experimental mechanics
Lecture 31 - Selection of an experimental technique - Part 1
Lecture 32 - Selection of an experimental technique - Part 2

NPTEL Video Course - Mechanical Engineering - NOC:Fluid Dynamics and Turbomachines

Subject Co-ordinator - Prof. Dhiman Chatterjee, Prof. Shamit Bakshi

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Micro and Nano Scale Energy Transport

Subject Co-ordinator - Dr. Arvind Pattamatta

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Electron Diffraction and Imaging

Subject Co-ordinator - Prof. Sundararaman M

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Phase Contrast Microscopy - 1
Lecture 31 - Phase Contrast Microscopy - 2
Lecture 32 - Phase Contrast Microscopy - 3
Lecture 33 - STEM
Lecture 34 - ELES and EDS
Lecture 35 - Recent trends
Lecture 36 - Energy dispersive Spectroscopy
Lecture 37 - Revision - 1
Lecture 38 - Revision - 2
Lecture 39 - Revision of Recent trends in Microscopy
Lecture 40 - Crystallography Revision

NPTEL Video Course - Mechanical Engineering - NOC:Acoustic and Noise Control

Subject Co-ordinator - Prof. Abijith Sarkar

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Steel Quality - Role of Secondary Refining and Continuous C

Subject Co-ordinator - Prof. Santanu Kr. Ray

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:X-ray Crystallography and Diffraction

Subject Co-ordinator - Prof. Ranjit Kumar Ray

Co-ordinating Institute - IIEST - Shibpur

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

NPTEL Video Course - Mechanical Engineering - NOC:Transport Phenomena in Materials

Subject Co-ordinator - Dr. G. Phanikumar

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Experimental Stress Analysis - An Overview

Subject Co-ordinator - Prof. K. Ramesh

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Mechanics of Human Movement

Subject Co-ordinator - Prof. Sujatha Srinivasan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Design for Quality, Manufacturing and Assembly

Subject Co-ordinator - Prof. Palaniappaan Ramu

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - General design guidelines for manual assembly
Lecture 31 - Systematic DFA methodology
Lecture 32 - Alpha symmetry, Beta symmetry
Lecture 33 - Quantification of part size and thickness
Lecture 34 - Systematic DFA Case study - controller assembly
Lecture 35 - DFA examples and discussion
Lecture 36 - Xerox Producibility Index (XPI)
Lecture 37 - High Speed and Robotic Assembly
Lecture 38 - Sheet Metal Working
Lecture 39 - Overview of DoE Workflow
Lecture 40 - DFA Software
Lecture 41 - DFM Software and Case Studies

NPTEL Video Course - Mechanical Engineering - NOC:Surrogates and Approximations in Engineering Design

Subject Co-ordinator - Prof. Palaniappaan Ramu

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Steel Quality: Role of Secondary Refining and Continuous Ca

Subject Co-ordinator - Prof. Santanu Kr. Ray

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Theory of Mechanism

Subject Co-ordinator - Prof. Sujatha Srinivasan

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Acceleration Analysis
Lecture 31 - Acceleration Analysis
Lecture 32 - Force Analysis of Mechanisms, Mechanical Advantage
Lecture 33 - Force Analysis of Mechanisms - II
Lecture 34 - Balancing of Mechanisms using Counterweights
Lecture 35 - Balancing of Mechanisms using Springs
Lecture 36 - Spatial Mechanisms
Lecture 37 - Introduction to the Kinematics of Spatial Mechanisms

NPTEL Video Course - Mechanical Engineering - NOC:Engineering Mechanics

Subject Co-ordinator - Prof. K. Ramesh

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - RFR- IV Crank and slotted bar
Lecture 31 - RFR-V Understanding Coriolis Acceleration
Lecture 32 - Kinetics - I
Lecture 33 - Kinetics - II
Lecture 34 - Kinetics - III
Lecture 35 - 3D Kinematics - I
Lecture 36 - 3D Kinematics - II
Lecture 37 - 3D Kinematics - III

NPTEL Video Course - Mechanical Engineering - NOC:Foundations of Computational Materials Modelling

Subject Co-ordinator - Dr.Narasimhan Swaminathan

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Introduction to the course
Lecture 2 - Some applications of MD simulations
Lecture 3 - Introduction to Bravais lattices and constructing simple crystals with MATLAB
Lecture 4 - Introduction to symmetry - 1
Lecture 5 - Symmetry Elements - 1
Lecture 6 - Symmetry elements - 2
Lecture 7 - Plane groups and their Hermann-Maugin (HM) symbols
Lecture 8 - Glide reflection; Examples of writing point group symbols; Wyckoff positions
Lecture 9 - Generating 2D crystal with MATLAB using Bilbao crystallography website
Lecture 10 - Symmetry of space groups
Lecture 11 - Hernann maugin symbols of space groups
Lecture 12 - Translational symmetry operators
Lecture 13 - The Space groups
Lecture 14 - Generation of crystals
Lecture 15 - Generation of monoclinic lattice
Lecture 16 - Introduction to Statistical Mechanica - 1
Lecture 17 - Introduction to Statistical Mechanica - 2
Lecture 18 - Introduction to Statistical Mechanics - 3
Lecture 19 - Statistical mechanics - 1
Lecture 20 - Statistical mechanics - 2
Lecture 21 - Basic introduction to mechanics
Lecture 22 - Introduction to phase space
Lecture 23 - Introduction to phase average and time average
Lecture 24 - Canonical ensemble; Partition function
Lecture 25 - Basic introduction to MD
Lecture 26 - Input script for LAMMPS - 1
Lecture 27 - Input script for LAMMPS - 2
Lecture 28 - Input script for LAMMPS - 3
Lecture 29 - Input script for LAMMPS - 4

Lecture 30 - LAMMPS exercises - 1
Lecture 31 - LAMMPS exercises - 2
Lecture 32 - LAMMPS exercises - 3
Lecture 33 - LAMMPS exercises - 4
Lecture 34 - LAMMPS exercises - 5

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Combustion for Propulsion

Subject Co-ordinator - Prof. S Varunkumar, Prof. H S Mukunda

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Summary - Premixed flames
Lecture 31 - Summary - Non-premixed flames
Lecture 32 - Summary - Solid rocket propulsion
Lecture 33 - Additional Insights

NPTEL Video Course - Mechanical Engineering - NOC:Basics of Materials Engineering

Subject Co-ordinator - Prof. Ratna Kumar Annabattula

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Static Failure Theories (Introduction, Definition of Failure)
Lecture 31 - Static Failure Theories (General form of failure theory, Stress tensor, Principal stress)
Lecture 32 - Static Failure Theories (Distortion Energy Theory)
Lecture 33 - Static Failure Theories (Maximum Shear Stress Theory)
Lecture 34 - Static Failure Theories (Design Problems)
Lecture 35 - Static Failure Theories (Failure of Brittle Materials)
Lecture 36 - Static Failure Theories (Coulomb-Mohr and Modified Coulomb-Mohr)
Lecture 37 - Static Failure Theories (Notches and Stress Concentration)
Lecture 38 - Introduction to Fracture Mechanics, Griffith's Analysis of a Cracked Body
Lecture 39 - Fracture Mechanics (Energy Release Rate)
Lecture 40 - Fracture Mechanics (Crack Resistance, Stress Intensity Factor, Fracture Toughness)
Lecture 41 - Fatigue Failure of Materials (Introduction, Historical Events, S-N Diagram)
Lecture 42 - Fatigue Failure of Materials (S-N Diagram, Types of Time Varying Loads)
Lecture 43 - Fatigue Failure of Materials (High Cycle Fatigue, Low Cycle Fatigue, Stress Ratio, Amplitude Rat
Lecture 44 - Fatigue Failure of Materials (Rotating Beam Bending Test, Estimated S-N diagram)
Lecture 45 - Fatigue Failure Theories (Fatigue strength correction factors)
Lecture 46 - Problems on Fatigue Failure-1 (S-N diagram and Corrected endurance strength)
Lecture 47 - Fatigue Failure of Materials (Features of Fatigue Failure; Factor of Safety in Life and Stress)
Lecture 48 - Fatigue Failure of Materials (Effect of Mean Stress)
Lecture 49 - Fatigue Failure of Materials (Multiaxial Fatigue and Variable Amplitude Loading)
Lecture 50 - Fatigue Failure of Materials (Fatigue Stress Concentration Factor)
Lecture 51 - Fatigue Failure of Materials (Fatigue Crack Growth, Paris' law)
Lecture 52 - Problems on Fatigue Failure-2 (Effect of mean stress, Fatigue crack growth)
Lecture 53 - Problems on Fatigue Failure-3 (Effect of Notch, Multiaxial Loading)
Lecture 54 - Phase Diagrams (Introduction)
Lecture 55 - Phase Diagrams (Language of Phase Diagrams, Types of Binary Phase Alloys)
Lecture 56 - Phase Diagrams (Tie line, Lever Rule, Indentifcation of compositions and weight fractions in two
Lecture 57 - Phase Diagrams (Type 1
Lecture 58 - Phase Diagrams (Conguent Melting Alloys, Type II Alloys, Eutectic Reaction)
Lecture 59 - Phase Diagrams (Type III Alloys with Partial Solubility in Solid State)
Lecture 60 - Phase Diagrams (Conguent melting alloys, Peritectic Reaction, Monotectic Reaction)
Lecture 61 - Phase Diagrams (Allotropy, Eutectoid and Peritectoid Reactions)
Lecture 62 - Phase Diagrams (Iron-Iron Carbide Phase Diagram)
Lecture 63 - Kinetics of Phase Transformations (Homogeneous Nucleation)
Lecture 64 - Kinetics of Phase Transformations (Heterogeneous Nucleation)
Lecture 65 - Isothermal Transformation Diagram
Lecture 66 - Martensite Transformation, C-C-T Diagram
Lecture 67 - Heat Treatment of Steels (Annealing and Normalizing)

NPTEL Video Course - Mechanical Engineering - NOC:Computational Fluid Dynamics using Finite Volume Method

Subject Co-ordinator - Prof. Kameswararao Anupindi

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Finite Volume Method for Convection and Diffusion
Lecture 31 - Finite Volume Method for Convection and Diffusion
Lecture 32 - Finite Volume Method for Convection and Diffusion
Lecture 33 - Finite Volume Method for Convection and Diffusion
Lecture 34 - Finite Volume Method for Convection-diffusion and fluid flow calculations
Lecture 35 - Finite Volume Method for Fluid Flow Calculations
Lecture 36 - Finite Volume Method for Fluid Flow Calculations
Lecture 37 - Finite Volume Method for Fluid Flow Calculations
Lecture 38 - Finite Volume Method for Fluid Flow Calculations
Lecture 39 - Finite Volume Method for Fluid Flow Calculations
Lecture 40 - Finite Volume Method for Fluid Flow Calculations
Lecture 41 - Finite Volume Method for Fluid Flow Calculations
Lecture 42 - Finite Volume Method for Fluid Flow Calculations

NPTEL Video Course - Mechanical Engineering - NOC:Wheeled Mobile Robots

Subject Co-ordinator - Prof. Asokan Thondiyath, Prof. Santhakumar Mohan

Co-ordinating Institute - IIT - Madras, IIT - Palakkad

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

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Combustion

Subject Co-ordinator - Prof. V. Raghavan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Oil Hydraulics and Pneumatics

Subject Co-ordinator - Prof. Somashekhar S

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Need for Air Dryer, Analysis of Moisture Removal from Air, Typical Air Drying Methods, Basic Typ
Lecture 31 - Construction and Operation of Refrigerated Air dyers, Absorption Dryer, Adsorption Dryer, Membra
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
Lecture 60 - Subsystems: Hydraulic Reservoir, Coolers and Filters
Lecture 61 - Subsystems: Hydraulic Fluids, Conduits and Simple Numericals
Lecture 62 - Subsystems: Hydraulic Fluids, Conduits and Simple Numericals
Lecture 63 - Subsystems: Hydraulic Fluids, Conduits and Simple Numericals
Lecture 64 - Subsystems: Hydraulic accumulators, Classifications, Applications, Accumulator physics, Maintena
Lecture 65 - Subsystems: Hydraulic accumulators, Classifications, Applications, Accumulator physics, Maintena
Lecture 66 - Subsystems: Hydraulic accumulators, Classifications, Applications, Accumulator physics, Maintena
Lecture 67 - Oil Hydraulic Circuits: Design and Analysis
Lecture 68 - Oil Hydraulic Circuits: Design and Analysis

NPTEL Video Course - Mechanical Engineering - Introduction to Turbomachines

Subject Co-ordinator - Prof. Babu Viswanathan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Mechanics and Control of Robotic Manipulators

Subject Co-ordinator - Prof. Santhakumar Mohan

Co-ordinating Institute - IIT - Palakkad

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

Lecture 30 - Trajectory generation using smooth functions
Lecture 31 - Trajectory generation schemes for serial manipulators
Lecture 32 - Trajectory generation using Matlab - Part 1
Lecture 33 - Trajectory generation using Matlab - Part 2
Lecture 34 - Trajectory generation for serial manipulators using matlab
Lecture 35 - Trajectory generation for serial manipulators with workspace using matlab
Lecture 36 - Introduction to robot motion control
Lecture 37 - Types of robot manipulator control and concerns
Lecture 38 - Kinematic control
Lecture 39 - Matlab simulation on kinematic control
Lecture 40 - Dynamic control
Lecture 41 - Simulations related to dynamic control schemes using Matlab - Part 1
Lecture 42 - Cascaded control design
Lecture 43 - Simulations related to dynamic control schemes using Matlab - Part 2
Lecture 44 - Simulations related to dynamic control schemes using Matlab - Part 3
Lecture 45 - Kinematic and dynamic models of a mobile robot using DH approach

NPTEL Video Course - Mechanical Engineering - Inverse Methods in Heat Transfer

Subject Co-ordinator - Prof. C.Balaji, Prof.S. Balaji

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Engineering Thermodynamics

Subject Co-ordinator - Prof. Babu Viswanathan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Applied Mechanics - Fluid Mechanics Laboratory

Subject Co-ordinator - Unknown

Co-ordinating Institute - IIT - Madras

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

Lecture 1 - Free and Forced Vortices - I
Lecture 2 - Free and Forced Vortices - II
Lecture 3 - Impact of Jet on hemispherical shell
Lecture 4 - Impact of Jet on horizontal flat plate
Lecture 5 - Pressure Distribution on a Circular Cylinder
Lecture 6 - Verification of Bernoullis Theorem
Lecture 7 - Visualization of potential flows
Lecture 8 - Visualization of vortex shredding
Lecture 9 - Wake Velocity Measurement for flow over a Circular Cylinder

NPTEL Video Course - Mechanical Engineering - NOC:Interfacial Fluid Mechanics

Subject Co-ordinator - Prof. Harish N Dixit

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Uniform flow down an incline
Lecture 31 - Shape of a falling jet
Lecture 32 - A quick tour of stability analysis
Lecture 33 - Rayleigh-Plateau instability - Part 1
Lecture 34 - Rayleigh-Plateau instability - Part 2
Lecture 35 - Rayleigh-Plateau instability - Part 3
Lecture 36 - Rupture of thin films - Part 1
Lecture 37 - Rupture of thin films - Part 2
Lecture 38 - Rupture of thin films - Effect of van der Waals force
Lecture 39 - Rupture of thin films - Part 3
Lecture 40 - Rupture of thin films - Part 4
Lecture 41 - Benard-Marangoni Instability - Part 1
Lecture 42 - Benard-Marangoni Instability - Part 2
Lecture 43 - Benard-Marangoni Instability - Part 3
Lecture 44 - Benard-Marangoni Instability - Part 4
Lecture 45 - Kelvin helmholtz instability - Part 1
Lecture 46 - Kelvin helmholtz instability - Part 2
Lecture 47 - Kelvin helmholtz instability - Part 3
Lecture 48 - Kelvin helmholtz instability - Part 4
Lecture 49 - Contact angle hysterisis
Lecture 50 - Thin film down an incline-a contact line problem - Part 1
Lecture 51 - Thin film down an incline-a contact line problem - Part 2
Lecture 52 - Local flow near a moving contact line
Lecture 53 - Modelling of moving contact line

NPTEL Video Course - Mechanical Engineering - Applied Thermodynamics

Subject Co-ordinator - Dr. Babu Viswanathan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - Heat Transfer (Prof .Dr.C. Balaji)

Subject Co-ordinator - Prof .Dr.C. Balaji

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Inverse Methods in Heat Transfer

Subject Co-ordinator - Prof. Balaji Srinivasan

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Introduction to Probability for Inverse Methods
Lecture 31 - Sum and Product Rules of Probability
Lecture 32 - Bayes Theorem - Simple Examples
Lecture 33 - Independence and Expectation
Lecture 34 - Variance and Covariance
Lecture 35 - Gaussian distribution and the standard normal table
Lecture 36 - Maximum Likelihood Estimate
Lecture 37 - MLE, MAP estimates
Lecture 38 - Introduction to Bayesian Methods for Inverse Problems
Lecture 39 - Offline Bayesian Estimation
Lecture 40 - Offline Bayesian Estimation - MATLAB Demo
Lecture 41 - MHMCMC for Inverse Problems
Lecture 42 - MHMCMC for Inverse Problems - MATLAB Demo
Lecture 43 - Why Machine Learning in Inverse Heat Transfer ?
Lecture 44 - Overview of AI and ML
Lecture 45 - Supervised Machine Learning as an Inverse Problem
Lecture 46 - Introduction to Week 9 - From Linear Models to Neural Networks
Lecture 47 - Gradient Descent - Batch, Stochastic and Mini Batch
Lecture 48 - Logistic Regression - The Forward Model
Lecture 49 - Logistic Regression - Binary Entropy Cost Function and Gradient
Lecture 50 - Multiclass Classification
Lecture 51 - Linear Separability and Neural Networks
Lecture 52 - Introduction to Week 10 - XOR and Deeper networks
Lecture 53 - Forward pass through a simple neural network
Lecture 54 - Backprop in a scalar chain
Lecture 55 - Backprop in a MLP
Lecture 56 - Introduction to Week 11 - ANNs as Surrogate models
Lecture 57 - Physics Informed Neural Networks - Introduction
Lecture 58 - Physics Informed Neural Networks - an intuitive explanation
Lecture 59 - Physics Informed Neural Networks - BC incorporation
Lecture 60 - PINNs for inverse problems
Lecture 61 - Introduction to Week 12 - Sensitivity Analysis
Lecture 62 - Code Examples of Logistic Regression - OR and AND gates
Lecture 63 - Code Example of shallow neural network - XOR gate
Lecture 64 - Code walkthrough for PINNs in Burgers equation
Lecture 65 - Formulation of a PINN based inverse problem in unsteady conduction
Lecture 66 - Formulation of a surrogate model based inverse solution in unsteady conduction
Lecture 67 - Summary of course

NPTEL Video Course - Mechanical Engineering - NOC:Sustainable Energy Technology

Subject Co-ordinator - Dr. Sayak Banerjee

Co-ordinating Institute - IIT - Hyderabad

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

Lecture 30 - Wind Turbine Parts and Performance - Part 1
Lecture 31 - Wind Turbine Parts and Performance - Part 2
Lecture 32 - Wind farms, Offshore Wind Turbines and Numerical Examples in Wind Energy - Part 1
Lecture 33 - Wind farms, Offshore Wind Turbines and Numerical Examples in Wind Energy - Part 2
Lecture 34 - Introduction to Solar Energy - Part 1
Lecture 35 - Introduction to Solar Energy - Part 2
Lecture 36 - Solar Thermal Energy Systems - Part 1
Lecture 37 - Solar Thermal Energy Systems - Part 2
Lecture 38 - Solar Water Heaters - Part 1
Lecture 39 - Solar Water Heaters - Part 2
Lecture 40 - Concentrated Solar Thermal Power (CSP)
Lecture 41 - Introduction to Solar Photovoltaic Systems - Part 1
Lecture 42 - Introduction to Solar Photovoltaic Systems - Part 2
Lecture 43 - Solar Photovoltaic Technology - Part 1
Lecture 44 - Solar Photovoltaic Technology - Part 2
Lecture 45 - Doping of a Semiconductor - Part 1
Lecture 46 - Doping of a Semiconductor - Part 2
Lecture 47 - Structure of a Solar Cell and its Electrical Properties - Part 1
Lecture 48 - Structure of a Solar Cell and its Electrical Properties - Part 2
Lecture 49 - Solar Cell Efficiency - Part 1
Lecture 50 - Solar Cell Efficiency - Part 2
Lecture 51 - Types of solar cells - Part 1
Lecture 52 - Types of solar cells - Part 2
Lecture 53 - Bioenergy and Biofuels - Part 1
Lecture 54 - Bioenergy and Biofuels - Part 2
Lecture 55 - Biofuel Feedstocks
Lecture 56 - Bioenergy Technology and Sustainability - Part 1
Lecture 57 - Bioenergy Technology and Sustainability - Part 2
Lecture 58 - Production Technologies for Bioethanol, Biodiesel and Biogas
Lecture 59 - Introduction of Geothermal Energy
Lecture 60 - Different types of Geothermal power systems
Lecture 61 - Characteristics of electricity demand and the technology is developed to respond the energy dema
Lecture 62 - Continuation of Enegry demand and adaptation of renewable energies
Lecture 63 - Introduction of Energy storage system
Lecture 64 - Major parameters of energy storage technology
Lecture 65 - Mechanical Energy Storage Technologies
Lecture 66 - Compressed Air Energy Storage System
Lecture 67 - Flywheel Based Energy Storage System - Part 1
Lecture 68 - Flywheel Based Energy Storage System - Part 2

Lecture 69 - Energy Storage System Through Capacitor
Lecture 70 - Electrolytic Capacitor
Lecture 71 - Super Capacitor
Lecture 72 - Electrochemical Energy Storage Systems
Lecture 73 - Performance Characteristics of Battery
Lecture 74 - Types of Rechargeable Batteries - Part 1
Lecture 75 - Types of Rechargeable Batteries - Part 2
Lecture 76 - Thermal Energy Storage Systems - Part 1
Lecture 77 - Thermal Energy Storage Systems - Part 2
Lecture 78 - Storage of Coolness and Synoptic View of Energy Storage Technology
Lecture 79 - Storage Needs for the Grid
Lecture 80 - Energy Storage Types
Lecture 81 - Trends in Energy Storage Types and their Characteristics
Lecture 82 - Analysis of Growth in Energy Storage-focussed on Pumped Hydro Storage, Flywheels and Li-ion batt
Lecture 83 - Fuel Cells and Hydrogen Energy Economy
Lecture 84 - Hydrogen production and storage technologies
Lecture 85 - Hydrogen storage technologies
Lecture 86 - Fuel cell technology
Lecture 87 - Fuel cell types
Lecture 88 - Carbon Capture and Storage (CCS) technologies - Part 1
Lecture 89 - Carbon Capture and Storage (CCS) technologies - Part 2

NPTEL Video Course - Mechanical Engineering - NOC:Strength of Materials - IITM

Subject Co-ordinator - Prof. K. Ramesh

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Review 1
Lecture 31 - Deflection 1 - Moment-Curvature and Load Deflection
Lecture 32 - Deflection 2 - Moment-Area Method
Lecture 33 - Deflection 3 - Method of Superposition and Energy Method
Lecture 34 - Deflection 4 - Fictitious Load Method
Lecture 35 - Theories of Failure 1 - Overview
Lecture 36 - Theories of Failure 2 - Yield surfaces, Mohr's Theory and Failure in Combined Loading
Lecture 37 - Stability 1 - Governing Equations, Fixed-free and Pinned-pinned
Lecture 38 - Stability 2 - Fixed-pinned, Fixed-fixed
Lecture 39 - Review 2

NPTEL Video Course - Mechanical Engineering - NOC:Engineering Thermodynamics

Subject Co-ordinator - Prof. V. Raghavan

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Tutorial 4 - Systems involving ideal gas mixtures - Part 1
Lecture 31 - Tutorial 4 - Systems involving ideal gas mixtures - Part 2
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
Lecture 65 - Tutorial 8 - Entropy - Part 5
Lecture 66 - Thermodynamic cycles - Part 1
Lecture 67 - Thermodynamic cycles - Part 2
Lecture 68 - Tutorial 9 - Thermodynamic cycles - Part 1

Lecture 69 - Tutorial 9 - Thermodynamic cycles - Part 2
Lecture 70 - Tutorial 9 - Thermodynamic cycles - Part 3

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

Subject Co-ordinator - Prof. V. Raghavan

Co-ordinating Institute - IIT - Madras

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

NPTEL Video Course - Mechanical Engineering - NOC:Applied Thermodynamics (2024)

Subject Co-ordinator - Prof. V. Raghavan

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Thermodynamic cycles - Air standard Brayton cycle - Part 1
Lecture 31 - Thermodynamic cycles - Air standard Brayton cycle - Part 2
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
Lecture 65 - Compressible flow through nozzles - Part 5
Lecture 66 - Compressible flow through nozzles - Part 6
Lecture 67 - Compressible flow through nozzles - Part 7
Lecture 68 - Compressible flow through nozzles - Part 8

Lecture 69 - Compressible flow through nozzles - Part 9
Lecture 70 - Compressible flow through nozzles - Part 10
Lecture 71 - Compressible flow through nozzles - Part 11
Lecture 72 - Compressible flow through nozzles - Part 12

NPTEL Video Course - Mechanical Engineering - NOC:Design of Mechanical Transmission Systems

Subject Co-ordinator - Prof. Ramkumar

Co-ordinating Institute - IIT - Madras

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

Lecture 30 - Clutch: Torque Transmitting Capacity - Uniform Pressure and Wear Theories
Lecture 31 - Clutch: Multiple Discs and Cone Clutches, Problem Solving
Lecture 32 - Clutch: Centrifugal Clutch
Lecture 33 - Clutch: Dynamic Analysis
Lecture 34 - Clutch: Dynamic Analysis Problem Solving

NPTEL Video Course - Mechanical Engineering - Advanced Manufacturing Processes

Subject Co-ordinator - Dr. A.K. Sharma

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - Computational Fluid Dynamics (Dr. K.M. Singh)

Subject Co-ordinator - Dr. K.M. Singh

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - Metal Casting

Subject Co-ordinator - Dr. D. B. Karunakar

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - Processing of non metals

Subject Co-ordinator - Dr. Inderdeep Singh

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - Vibration control

Subject Co-ordinator - Dr. S. P. Harsha

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - Welding Engineering

Subject Co-ordinator - Dr. D.K. Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Type of joints and welds
Lecture 31 - Edge preparation
Lecture 32 - Design for static and fatigue loading
Lecture 33 - Fatigue fracture of weld joints - I
Lecture 34 - Fatigue fracture of weld joints - II
Lecture 35 - Introduction-
Lecture 36 - DT & NDT
Lecture 37 - Understanding Weldability
Lecture 38 - Reactions in weldment
Lecture 39 - Weldability of Al alloys
Lecture 40 - Failure analysis and prevention

NPTEL Video Course - Mechanical Engineering - Industrial Engineering

Subject Co-ordinator - Prof. P.K. Jain, Dr. Pradeep Kumar, Dr. Inderdeep Singh, Dr. D.K. Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Network Analysis - Part II
Lecture 31 - Facility Design Part - Part I
Lecture 32 - Facility Design Part - Part II
Lecture 33 - Facility Design Part - Part III
Lecture 34 - Facility Design Part - Part IV
Lecture 35 - Product Design Development
Lecture 36 - Materials Handling
Lecture 37 - Quality Concepts
Lecture 38 - Value Engineering
Lecture 39 - Reliability
Lecture 40 - Industrial Safety

NPTEL Video Course - Mechanical Engineering - Manufacturing Processes I

Subject Co-ordinator - Dr. D.B. Karunakar, Dr. Inderdeep Singh. Dr. D.K. Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - Strength of Materials

Subject Co-ordinator - Dr. S.P. Harsha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Strength of Materials
Lecture 31 - Strength of Materials
Lecture 32 - Strength of Materials
Lecture 33 - Strength of Materials
Lecture 34 - Strength of Materials
Lecture 35 - Strength of Materials
Lecture 36 - Strength of Materials
Lecture 37 - Strength of Materials
Lecture 38 - Strength of Materials
Lecture 39 - Strength of Materials
Lecture 40 - Strength of Materials

NPTEL Video Course - Mechanical Engineering - NOC:Two Phase Flow and Heat Transfer

Subject Co-ordinator - Dr. Arup Kumar Das

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Refrigeration and Air-Conditioning

Subject Co-ordinator - Prof. Ravi Kumar

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Cooling Load - 2
Lecture 31 - Cooling Load - 3
Lecture 32 - Air Distribution System - 1
Lecture 33 - Air Distribution System - 2
Lecture 34 - Problem Solving - 2
Lecture 35 - Air-Conditioning Systems
Lecture 36 - Human Physiology
Lecture 37 - Thermal Comfort
Lecture 38 - Indoor Environmental Health - 1
Lecture 39 - Indoor Environmental Health - 2
Lecture 40 - Problem Solving - 3

NPTEL Video Course - Mechanical Engineering - NOC:Engineering Economic Analysis

Subject Co-ordinator - Dr. Pradeep K. Jha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction to Engineering Economy, Physical and Economic Environment, Phases in Engg. process
Lecture 2 - Some economic concepts, Value and utility, Interest and Interest rate, Time value of money
Lecture 3 - Interest formulas
Lecture 4 - Interest formulas for discrete compounding and discrete payments
Lecture 5 - Interest formulas for discrete compounding and discrete payments
Lecture 6 - Problem solving on discrete compounding, discrete payment
Lecture 7 - Interest formulas for Uniform gradient series
Lecture 8 - Interest formulas for geometric gradient series
Lecture 9 - Compounding frequency of Interest
Lecture 10 - Problem solving on frequency compounding of interest and gradient series factors
Lecture 11 - Economic equivalence
Lecture 12 - Equivalence calculations involving cash flows
Lecture 13 - Methods of comparison of alternatives
Lecture 14 - comparison of alternatives
Lecture 15 - Problem solving on equivalence and comparison of alternatives
Lecture 16 - Replacement analysis
Lecture 17 - Proper treatment of sunk cost in replacement
Lecture 18 - Replacement because of improved efficiency, inadequacy, demand etc.
Lecture 19 - Problem solving on replacement analysis
Lecture 20 - Economic life of the asset
Lecture 21 - Depreciation
Lecture 22 - Basic depreciation methods
Lecture 23 - Depreciation
Lecture 24 - Modified accelerated cost recovery system (MACRS) method of depreciation, Depletion
Lecture 25 - Depreciation
Lecture 26 - Problem solving based on Depreciation and Depletion
Lecture 27 - Elements of cost
Lecture 28 - Breakeven analysis, Effect of fixed and variable cost on BEP.
Lecture 29 - Economic order quantity

NPTEL Video Course - Mechanical Engineering - NOC:Convective Heat Transfer

Subject Co-ordinator - Dr. Arup Kumar Das

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Mechanical Vibration

Subject Co-ordinator - Prof. Anil Kumar

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Lesson 5 - Undamped forced vibration with harmonic excitation
Lecture 31 - Lesson 1 - Undamped dynamic vibration absorber
Lecture 32 - Lesson 2 - Tuned absorber
Lecture 33 - Lesson 3 - Numerical problems
Lecture 34 - Lesson 4 - Damped dynamic vibration absorber
Lecture 35 - Lesson 5 - Optimally tuned vibration absorber
Lecture 36 - Lesson 1 - Undamped free vibration
Lecture 37 - Lesson 2 - Eigen values and eigen vectors
Lecture 38 - Lesson 3 - Flexibility influence coefficients
Lecture 39 - Lesson 4 - Stiffness influence coefficients
Lecture 40 - Lesson 5 - Static and dynamic coupling

NPTEL Video Course - Mechanical Engineering - NOC:Joining Technologies for Metals

Subject Co-ordinator - Prof. Dheerendra Kumar Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Modelling and Simulation of Dynamic Systems

Subject Co-ordinator - Prof. Pushparaj Mani Pathak

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Bode Plot
Lecture 31 - Simulation using SIMULINK
Lecture 32 - Simulation of simple and compound pendulums
Lecture 33 - Simulation of planar mechanisms
Lecture 34 - Simulation of wheeled mobile robots
Lecture 35 - Validation and Verification of Simulation Models
Lecture 36 - Parameter estimation methods
Lecture 37 - Parameter estimation examples
Lecture 38 - System identifications
Lecture 39 - Introduction to Optimization
Lecture 40 - Optimization with modeling of engineering problems

NPTEL Video Course - Mechanical Engineering - NOC:Principles of Casting Technology

Subject Co-ordinator - Dr. Pradeep K. Jha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Melting practices
Lecture 31 - Melting and Casting of cast metal
Lecture 32 - Melting practice for gray iron
Lecture 33 - Melting practice for Malleable iron and S.G iron
Lecture 34 - Casting of steel and alloy steel
Lecture 35 - Casting practices for non-ferrous metals and alloys
Lecture 36 - Fettling of castings
Lecture 37 - Heat treatment of castings
Lecture 38 - Heat treatment practices for cast iron and non-ferrous metals and alloys
Lecture 39 - Casting defects
Lecture 40 - Diagnostics of casting defects

NPTEL Video Course - Mechanical Engineering - NOC:Steam and Gas Power Systems

Subject Co-ordinator - Prof. Ravi Kumar

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Product Design and Development

Subject Co-ordinator - Prof. Indradeep Singh

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Fundamentals of Manufacturing Processes

Subject Co-ordinator - Dr. D. K. Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Metal Working Processes
Lecture 31 - Sheet Metal Operations
Lecture 32 - Metal Working Processes
Lecture 33 - Metal Working Processes
Lecture 34 - Metal Working Processes
Lecture 35 - Material Removal Processes
Lecture 36 - Material Removal Processes
Lecture 37 - Material Removal Processes
Lecture 38 - Material Removal Processes
Lecture 39 - Material Removal Processes
Lecture 40 - Material Removal Processes
Lecture 41 - Material Removal Processes
Lecture 42 - Material removal processes
Lecture 43 - Material removal processes
Lecture 44 - Material removal Processes
Lecture 45 - Material removal Processes
Lecture 46 - Material removal processes
Lecture 47 - Joining of metals
Lecture 48 - Joining of metals
Lecture 49 - Joining of metals
Lecture 50 - Brazing, soldering and weldability
Lecture 51 - Weldability and welding defects
Lecture 52 - Heat treatment
Lecture 53 - Heat treatment
Lecture 54 - Heat treatment
Lecture 55 - Heat treatment
Lecture 56 - Heat treatment
Lecture 57 - Improving surface properties
Lecture 58 - Improving surface properties
Lecture 59 - Improving surface properties
Lecture 60 - Improving surface properties

NPTEL Video Course - Mechanical Engineering - NOC:Modelling and Simulation of Discrete Event System

Subject Co-ordinator - Dr. Pradeep K. Jha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction to Simulation
Lecture 2 - Concept of System, Model and Simulation
Lecture 3 - Time advance mechanism, Components of a simulation model
Lecture 4 - Program organization and logic, Steps in a simulation study
Lecture 5 - Simulation examples
Lecture 6 - Statistical Models in Simulation
Lecture 7 - Input probability distribution functions for discrete systems
Lecture 8 - Continuous distribution functions
Lecture 9 - Continuous distribution functions and empirical distribution functions
Lecture 10 - Problem solving on statistical models in simulation
Lecture 11 - Characteristics of a queueing system
Lecture 12 - Performance measures of queueing system
Lecture 13 - Analysis of a single server queueing system
Lecture 14 - Simulation of a single server queueing system
Lecture 15 - Computer representation of simulation of single server queuing system
Lecture 16 - Generation of Random Numbers
Lecture 17 - Issues and Challenges in Congruential Generators
Lecture 18 - Testing of random numbers
Lecture 19 - Generation of Random Variates
Lecture 20 - Problem Solving on Random Number and Random Variate Generation
Lecture 21 - Input modeling
Lecture 22 - Input modeling
Lecture 23 - Input modeling
Lecture 24 - Input modeling
Lecture 25 - Problem Solving on input modeling
Lecture 26 - Output analysis of a single system
Lecture 27 - Obtaining a specified precision
Lecture 28 - Comparison of alternative system configurations
Lecture 29 - Confidence Intervals for comparing more than two systems

Lecture 30 - Problem Solving on output analysis of single and alternative systems
Lecture 31 - Introduction to simulation of manufacturing and material handling system
Lecture 32 - Issues in material handling system
Lecture 33 - Modeling of system randomness
Lecture 34 - Verification of simulation models
Lecture 35 - Model validity and credibility
Lecture 36 - Problem solving and case studies on simulation of manufacturing system
Lecture 37 - Introduction to Monte Carlo Simulation
Lecture 38 - Inventory Control Simulation using Monte Carlo Technique
Lecture 39 - In this lecture, Monte Carlo technique was used to solve inventory system problems
Lecture 40 - Problem solving on Monte Carlo Simulation

NPTEL Video Course - Mechanical Engineering - NOC:Processing of Polymers and Polymer Composites

Subject Co-ordinator - Dr. Inderdeep Singh

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Operations Management

Subject Co-ordinator - Dr. Inderdeep Singh

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Capacity Planning
Lecture 31 - Project Scheduling
Lecture 32 - Network Diagrams
Lecture 33 - Critical Path Method
Lecture 34 - Critical Path Method
Lecture 35 - Critical Path Method
Lecture 36 - Program Evaluation and Review Technique (PERT)
Lecture 37 - PERT Problems - I
Lecture 38 - PERT Problems - II
Lecture 39 - Time Cost Trade Off (Crashing)
Lecture 40 - Project Network
Lecture 41 - Production Control
Lecture 42 - Sequencing
Lecture 43 - Sequencing Problems - I
Lecture 44 - Sequencing Problems - II
Lecture 45 - Master Production Scheduling (MPS)
Lecture 46 - Concept of Quality
Lecture 47 - Total Quality Management (TQM)
Lecture 48 - Total Productive Maintenance
Lecture 49 - Statistical Quality Control (SQC)
Lecture 50 - Six Sigma
Lecture 51 - Materials Management
Lecture 52 - Inventory Control
Lecture 53 - Economic Order Quantity (EOQ) Models
Lecture 54 - Economic Order Quantity (EOQ)
Lecture 55 - Production Quantity Model
Lecture 56 - Just In time (JIT)
Lecture 57 - Kanban System
Lecture 58 - Materials Requirement Planning (MRP) - I
Lecture 59 - Materials Requirement Planning (MRP) - II
Lecture 60 - Enterprise Resource Planning (ERP)

NPTEL Video Course - Mechanical Engineering - NOC:Theory of Production Processes

Subject Co-ordinator - Dr. Pradeep K. Jha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Temperature in metalworking
Lecture 31 - Rolling process
Lecture 32 - Analysis of rolling operation
Lecture 33 - Introduction to forging Process
Lecture 34 - Analysis of forging process
Lecture 35 - Problem solving on rolling and forging processes
Lecture 36 - Extrusion process
Lecture 37 - Drawing of rods, tubes and wires
Lecture 38 - Analysis of drawing operation
Lecture 39 - Sheet metal operations
Lecture 40 - Metal Forming Defects
Lecture 41 - Classification of joining processes
Lecture 42 - Heat flow in welding
Lecture 43 - Metallurgy of fusion welds
Lecture 44 - Heat affected zone in welding
Lecture 45 - Heat treatment processes in welding
Lecture 46 - Principle of shield arc welding processes
Lecture 47 - Principle of gas shield arc welding processes
Lecture 48 - Principle of Resistance welding
Lecture 49 - Principle of Solid State Welding Processes
Lecture 50 - Brazing, soldering and adhesive bonding
Lecture 51 - Residual stresses in welding
Lecture 52 - Methods of controlling residual stresses in welding
Lecture 53 - Welding Distortion
Lecture 54 - Control of welding distortion
Lecture 55 - Preheat and postweld heat treatment of weldments
Lecture 56 - Weldability of metals
Lecture 57 - Weldability of steels
Lecture 58 - Weldability of cast iron
Lecture 59 - Weldability of non-ferrous materials
Lecture 60 - Welding defects

NPTEL Video Course - Mechanical Engineering - NOC:Automatic Control

Subject Co-ordinator - Dr. Anil Kumar

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Failure Analysis and Prevention

Subject Co-ordinator - Dr. D. K. Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction - Need and scope of failure analysis and prevention
Lecture 2 - Introduction - Engineering disasters and understanding failures
Lecture 3 - Fundamental sources of failures - Deficient design - I
Lecture 4 - Fundamental sources of failures - Deficient design - II
Lecture 5 - Fundamental sources of failures - Deficient design - III and upgrading of a part
Lecture 6 - Fundamental sources of failures - Imperfections in base metals
Lecture 7 - Fundamental sources of failures - Improper Manufacturing - I
Lecture 8 - Fundamental sources of failures - Improper Manufacturing - II
Lecture 9 - Fundamental sources of failures - Improper Manufacturing - III
Lecture 10 - Fundamental sources of failures - Improper Manufacturing - IV and improper service conditions
Lecture 11 - Fundamental sources of failures - Poor assembly, service and maintenance
Lecture 12 - Industrial engineering tool for failure analysis - Pareto diagram
Lecture 13 - Industrial engineering tool for failure analysis - Fishbone diagram and FMEA
Lecture 14 - Industrial engineering tool for failure analysis - FMEA
Lecture 15 - Industrial engineering tool for failure analysis - Fault tree analysis
Lecture 16 - Industrial engineering tool for failure analysis - Reliability - I
Lecture 17 - Industrial engineering tool for failure analysis - Reliability - II
Lecture 18 - General procedure of failure analysis - Steps
Lecture 19 - General procedure of failure analysis - Background information collection
Lecture 20 - General procedure of failure analysis - Preliminary examination
Lecture 21 - General procedure of failure analysis - NDT for failure analysis
Lecture 22 - General procedure of failure analysis - Destructive testing
Lecture 23 - General procedure of failure analysis - DT, selection, preservation, cleaning and sectioning of
Lecture 24 - General procedure of failure analysis - Macroscopy of fracture surfaces - I
Lecture 25 - General procedure of failure analysis - Macroscopy of fracture surfaces - II
Lecture 26 - General procedure of failure analysis - Macroscopy of fracture surfaces - III
Lecture 27 - General procedure of failure analysis - Macroscopy of fracture surfaces - IV
Lecture 28 - General procedure of failure analysis - Microscopy of fracture surfaces
Lecture 29 - General procedure of failure analysis - Metallography of failed components

Lecture 30 - General procedure of failure analysis - Determination of type of fracture - I
Lecture 31 - General procedure of failure analysis - Determination of type of fracture - II
Lecture 32 - General procedure of failure analysis - Determination of type of fracture - III and chemical ana
Lecture 33 - General procedure of failure analysis - Application of fracture mechanics - I
Lecture 34 - General procedure of failure analysis - Application of fracture mechanics - II
Lecture 35 - General procedure of failure analysis - Simulated test service conditions and analysis of evider
Lecture 36 - General procedure of failure analysis - Question for analysis
Lecture 37 - General procedure of failure analysis - Reporting failure analysis and failure analysis of welde
Lecture 38 - General procedure of failure analysis - Failure analysis of weld joint
Lecture 39 - General procedure of failure analysis - Examples of failure analysis
Lecture 40 - General procedure of failure analysis - Embrittlement of steels

NPTEL Video Course - Mechanical Engineering - NOC:Mechanical Measurement System

Subject Co-ordinator - Prof. Ravi Kumar

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Temperature measurement - 2
Lecture 31 - Strain gauges
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 Video Course - Mechanical Engineering - NOC:Fundamentals of Surface Engineering: Mechanisms, Processes

Subject Co-ordinator - Dr. D. K. Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

Lecture 1 - Introduction and need of surface engineering
Lecture 2 - Surface/sub-surface regions and properties of importance for surface engineering
Lecture 3 - Surface properties and their modification
Lecture 4 - Classification of surface modification techniques - I
Lecture 5 - Classification of surface modification techniques - II
Lecture 6 - Comparison of surface modification techniques and scope of surface engineering
Lecture 7 - Scope of surface engineering - I
Lecture 8 - Surface properties for wear and friction resistance - I
Lecture 9 - Surface properties for wear and friction resistance - II
Lecture 10 - Surface properties for wear and friction resistance - III
Lecture 11 - Issues and application of surface modification
Lecture 12 - Surface damage
Lecture 13 - Surface damage
Lecture 14 - Surface damage
Lecture 15 - Surface damage
Lecture 16 - Surface damage
Lecture 17 - Surface damage
Lecture 18 - Surface damage
Lecture 19 - Surface damage
Lecture 20 - Surface damage
Lecture 21 - Properties and mode of wear
Lecture 22 - Metal systems
Lecture 23 - Thermal barrier coatings
Lecture 24 - Functionally graded materials and other materials
Lecture 25 - Surface modification techniques
Lecture 26 - Surface modification techniques
Lecture 27 - Surface modification techniques
Lecture 28 - Surface modification techniques
Lecture 29 - Surface modification techniques

Lecture 30 - Surface modification techniques
Lecture 31 - Surface modification techniques
Lecture 32 - Surface modification techniques
Lecture 33 - Surface modification techniques
Lecture 34 - Surface modification techniques
Lecture 35 - Surface modification techniques
Lecture 36 - Surface modification techniques
Lecture 37 - Surface modification techniques
Lecture 38 - Surface modification techniques
Lecture 39 - Surface modification techniques
Lecture 40 - Surface modification techniques
Lecture 41 - Surface modification techniques
Lecture 42 - Surface modification techniques
Lecture 43 - Surface modification techniques
Lecture 44 - Surface modification techniques
Lecture 45 - Surface modification techniques
Lecture 46 - Surface modification techniques
Lecture 47 - Surface modification techniques
Lecture 48 - Surface modification techniques
Lecture 49 - Surface modification techniques
Lecture 50 - Surface modification techniques
Lecture 51 - Surface modification techniques
Lecture 52 - Surface modification techniques
Lecture 53 - Surface modification techniques
Lecture 54 - Surface modification techniques
Lecture 55 - Characterization of modified surfaces
Lecture 56 - Characterization of modified surfaces
Lecture 57 - Characterization of modified surfaces
Lecture 58 - Characterization of modified surfaces
Lecture 59 - Characterization of modified surfaces
Lecture 60 - Characterization of modified surfaces

NPTEL Video Course - Mechanical Engineering - NOC:Work System Design

Subject Co-ordinator - Dr. Inderdeep Singh

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - SIMO Charts
Lecture 31 - Memo-Motion Study
Lecture 32 - Cycle Graph and Chronocycle Graph
Lecture 33 - Critical Examination Techniques
Lecture 34 - Development and Selection of New Method
Lecture 35 - Installation and Maintenance of Improved Methods
Lecture 36 - Work Measurement
Lecture 37 - Techniques of Work Measurement
Lecture 38 - Steps Involved in Time Study
Lecture 39 - Steps and Equipment of Time Study
Lecture 40 - Performance Rating
Lecture 41 - Performance Rating
Lecture 42 - Allowances in Time Study
Lecture 43 - Computation of Standard Time - I
Lecture 44 - Computation of Standard Time - II
Lecture 45 - Work Measurement
Lecture 46 - Work Sampling
Lecture 47 - Procedure of Work Sampling
Lecture 48 - Work Sampling
Lecture 49 - Introduction to Synthetic Data and PMTS
Lecture 50 - Introduction to MTM and MOST
Lecture 51 - Ergonomics
Lecture 52 - Industrial Ergonomics
Lecture 53 - Ergonomics
Lecture 54 - Man-Machine System - 1
Lecture 55 - Man-Machine System - 2
Lecture 56 - Case Study
Lecture 57 - Case Study
Lecture 58 - Case Study
Lecture 59 - Case Study
Lecture 60 - Case Study

NPTEL Video Course - Mechanical Engineering - NOC:Principles of Metal Forming Technology

Subject Co-ordinator - Dr. Pradeep K. Jha

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Radiative Heat Transfer

Subject Co-ordinator - Prof. Ankit Bansal

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Atomic and Molecular Spectra
Lecture 31 - Line Radiation
Lecture 32 - Spectral Modelling
Lecture 33 - Wide Band Models
Lecture 34 - WSGG Model
Lecture 35 - k-Distribution Model
Lecture 36 - Radiative Properties of Particulate Media
Lecture 37 - Combustion and Flame
Lecture 38 - Solar and Atmospheric Radiation
Lecture 39 - Concentrated Solar Collector
Lecture 40 - Experimental Methods

NPTEL Video Course - Mechanical Engineering - NOC:Weldability of Metals

Subject Co-ordinator - Dr. D. K. Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Weldability of Cr-Mo Steel - III
Lecture 31 - Weldability of Pre-Coated Steel - I
Lecture 32 - Weldability of Pre-Coated Steel - II
Lecture 33 - Weldability of Stainless Steel - I
Lecture 34 - Weldability of Stainless Steel - II
Lecture 35 - Weldability of Martensitic Stainless Steel - I
Lecture 36 - Weldability of Martensitic Stainless Steel - II
Lecture 37 - Weldability of Ferritic Stainless Steel - I
Lecture 38 - Weldability of Austenitic Stainless Steel - I
Lecture 39 - Weldability of Austenitic Stainless Steel - II
Lecture 40 - Weldability of PH Stainless Steel

NPTEL Video Course - Mechanical Engineering - NOC:Manufacturing Guidelines for Product Design

Subject Co-ordinator - Dr. Inderdeep Singh

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Design guidelines
Lecture 31 - Induction Welding
Lecture 32 - Ultrasonic Welding
Lecture 33 - Vibration and Spin Welding
Lecture 34 - Microwave Joining
Lecture 35 - Hole making
Lecture 36 - Design for Environment
Lecture 37 - Design for Environment
Lecture 38 - Product Architecture
Lecture 39 - Rapid Prototyping
Lecture 40 - Product Design

NPTEL Video Course - Mechanical Engineering - NOC:Inspection and Quality Control in Manufacturing

Subject Co-ordinator - Prof. Kaushik Pal

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Financial Mathematics

Subject Co-ordinator - Dr. Pradeep K. Jha

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Graduated Payment Mortgage, Sinking Funds
Lecture 31 - Introduction to Depreciation and Depletion
Lecture 32 - Types of Depreciation
Lecture 33 - Tax Depreciation Methods
Lecture 34 - SOD and UOP Method of Depreciation, Depletion
Lecture 35 - Problem Solving on Depreciation and Depletion
Lecture 36 - Introduction to Break-Even Analysis
Lecture 37 - Analysis of Break-Even Time and Dual Break-Even Points
Lecture 38 - Economic Order Quantity
Lecture 39 - Introduction to Leverage
Lecture 40 - Financial Leverage and Total Leverage
Lecture 41 - Introduction to Stocks
Lecture 42 - Stock Valuation
Lecture 43 - Two Stage Dividend Growth and Preferred Stocks
Lecture 44 - Introduction to Bonds
Lecture 45 - Bond Premium and Discount, Bond Purchase
Lecture 46 - Introduction to Mutual funds
Lecture 47 - Performance Measures
Lecture 48 - Options
Lecture 49 - Option Valuation
Lecture 50 - Introduction to Cost of Capital and Ratio Analysis
Lecture 51 - Introduction to Risk Measurement
Lecture 52 - Decision-Making Under Risk
Lecture 53 - Decision Under Uncertainty
Lecture 54 - Risk Premium, Portfolio Return and Risk
Lecture 55 - Portfolio Diversification
Lecture 56 - Introduction to Insurance, Mortality Table
Lecture 57 - Pure Endowment and Life Annuities
Lecture 58 - Introduction to Life Insurance
Lecture 59 - Types of Life Insurance Policies
Lecture 60 - Reserve Funds, Property and Casualty Insurance

NPTEL Video Course - Mechanical Engineering - NOC:Product Design Using Value Engineering

Subject Co-ordinator - Dr. Inderdeep Singh

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Selection of Nanomaterials for Energy Harvesting and Storag

Subject Co-ordinator - Prof. Kaushik Pal

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Robotics and Control: Theory and Practice

Subject Co-ordinator - Prof. N. Sukavanam, Prof. M. Felix Orlando

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Acoustic Metamaterials

Subject Co-ordinator - Prof. Sneha Singh

Co-ordinating Institute - IIT - Roorkee

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

NPTEL Video Course - Mechanical Engineering - NOC:Power Plant Engineering

Subject Co-ordinator - Prof. Ravi Kumar

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Solar radiations
Lecture 31 - Solar thermal power
Lecture 32 - Wind energy
Lecture 33 - Wave and geothermal energy
Lecture 34 - Photo-voltaic conversion
Lecture 35 - Problem solving - IV
Lecture 36 - Direct energy conversion
Lecture 37 - Instrumentation in power plant
Lecture 38 - Economic of power generation
Lecture 39 - Environmental aspects of power generation
Lecture 40 - Problem solving - V

NPTEL Video Course - Mechanical Engineering - NOC:Principles of Industrial Engineering

Subject Co-ordinator - Prof. D K Dwivedi

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Production Planning and Control
Lecture 31 - Production Planning and Control
Lecture 32 - Production Planning and Control
Lecture 33 - Production Planning and Control
Lecture 34 - Production Planning and Control
Lecture 35 - Production Planning and Control
Lecture 36 - Inventory
Lecture 37 - Inventory
Lecture 38 - Inventory
Lecture 39 - Inventory
Lecture 40 - Inventory
Lecture 41 - Project Management and Network Modelling
Lecture 42 - Network Modelling
Lecture 43 - Network Analysis
Lecture 44 - Network Analysis
Lecture 45 - Network Analysis
Lecture 46 - Network Analysis
Lecture 47 - Forecasting
Lecture 48 - Forecasting
Lecture 49 - Forecasting
Lecture 50 - Forecasting
Lecture 51 - Forecasting
Lecture 52 - Forecasting
Lecture 53 - Quality Control
Lecture 54 - Quality Control
Lecture 55 - Quality Control
Lecture 56 - Quality Control
Lecture 57 - Quality Control
Lecture 58 - Quality Control
Lecture 59 - Quality Control
Lecture 60 - Productivity and Work Study

NPTEL Video Course - Mechanical Engineering - NOC:Mechatronics

Subject Co-ordinator - Prof. Pushparaj Mani Pathak

Co-ordinating Institute - IIT - Roorkee

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

Lecture 30 - Transfer Function and Frequency Response
Lecture 31 - Controllers
Lecture 32 - Digital Controllers
Lecture 33 - Program Logic Controllers
Lecture 34 - Input, output and Communication systems
Lecture 35 - Fault Finding
Lecture 36 - Project using Microcontroller - ATMEGA16
Lecture 37 - Myoelectrically Controlled Robotic Arm
Lecture 38 - ABU Robocon 2019 - Part I
Lecture 39 - ABU Robocon 2019 - Part II
Lecture 40 - Design of a Legged Robot

NPTEL Video Course - Mechanical Engineering - Micro and Smart Systems

Subject Co-ordinator - Dr. K.J. Vinoy, Prof. S. Gopalakrishnan, Prof. K.N. Bhat, Prof. G.K. Anathasuresh

Co-ordinating Institute - IISc - Bangalore

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

NPTEL Video Course - Mechanical Engineering - NOC:Variational Methods in Mechanics

Subject Co-ordinator - Prof. G.K. Anathasuresh

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - General variation of a functional, transversality conditions. Broken extremals, Wierstrass-Erdma
Lecture 31 - General variation of a functional, transversality conditions. Broken extremals, Wierstrass-Erdma
Lecture 32 - Variational (energy) methods in statics; principles of minimum potential energy and virtual work
Lecture 33 - General framework of optimal structural designs - Part I
Lecture 34 - General framework of optimal structural designs - Part II
Lecture 35 - Optimal structural design of bars and beams using the optimality criteria method
Lecture 36 - Invariants of Euler-Lagrange equations and canonical forms
Lecture 37 - NoetherÂ s theorem
Lecture 38 - Minimum characterization of Sturm-Liouville problems
Lecture 39 - Rayleigh quotient for natural frequencies and mode shapes of elastic systems
Lecture 40 - Stability analysis and buckling using calculus of variations
Lecture 41 - Strongest (most stable) column
Lecture 42 - Dynamic compliance optimization
Lecture 43 - Electro-thermal-elastic structural optimization
Lecture 44 - Formulating the extremization problem starting from the differential equation, self-adjointness

NPTEL Video Course - Mechanical Engineering - NOC:Compliant Mechanisms: Principles and Design

Subject Co-ordinator - Prof. G. K. Ananthasuresh

Co-ordinating Institute - IISc - Bangalore

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

Lecture 1 - Overview
Lecture 2 - Spirit of compliant design
Lecture 3 - A glimpse of applications
Lecture 4 - Mobility and degrees of freedom in compliant mechanisms
Lecture 5 - MaxwellÂ s rule and GrÃ¼blerÂ s formula
Lecture 6 - Using compatibility and force equilibrium matrices to identify degrees of freedom and states of s
Lecture 7 - Empirical formula for flexure joints
Lecture 8 - Types of elastic pairs (flexures)
Lecture 9 - Linear finite element analysis of compliant mechanisms with beam elements
Lecture 10 - A compliant mechanism kit
Lecture 11 - Linear and nonlinear finite element analyses using continuum elements
Lecture 12 - Subtleties in finite element analysis: geometric nonlinearity and contact
Lecture 13 - Deformation of a cantilever under a tip-load, using elliptic integrals
Lecture 14 - Elliptic integrals and their use in elastica analysis
Lecture 15 - Frisch-FayÂ s approach to large deformation of beam
Lecture 16 - Burns-CrossleyÂ s kinematic model
Lecture 17 - Howell-MidhaÂ s elastic model
Lecture 18 - Putting together the pseudo rigid-body model
Lecture 19 - Modeling a partially compliant mechanism
Lecture 20 - Kinematic coefficients of a four-bar linkage with and without springs
Lecture 21 - Solving equations of PRB modeling and comparing with finite element analysis
Lecture 22 - Loop-closure equations for PRB models of compliant mechanisms
Lecture 23 - Burmester theory for compliant mechanisms
Lecture 24 - PRB-based Synthesis Examples
Lecture 25 - Structural optimization approach
Lecture 26 - Early works on design for compliance
Lecture 27 - Design for deflection of trusses
Lecture 28 - Design for deflection of beams and frames
Lecture 29 - Design of elastic continua for desired deflection

Lecture 30 - Continuum element-based topology optimization of compliant mechanisms
Lecture 31 - YinSyn; synthesis of nonlinear responses with compliant mechanisms
Lecture 32 - Five different formulations for compliant mechanism design and some benchmark problems
Lecture 33 - Distributed compliance
Lecture 34 - How to achieve distributed compliance
Lecture 35 - Shape optimization
Lecture 36 - Cam-flexure clamp-case-study
Lecture 37 - SL model for compliant mechanisms
Lecture 38 - Feasibility maps for compliant mechanisms
Lecture 39 - Selection of compliant mechanisms for given user-specifications
Lecture 40 - Two case-studies using feasibility maps technique
Lecture 41 - SML model for compliant mechanisms for dynamic response
Lecture 42 - Re-design of compliant mechanisms; Matlab and Java codes
Lecture 43 - Non-dimensional analysis of beams
Lecture 44 - Deformation index and slenderness ratio of compliant mechanisms
Lecture 45 - Kinetoelastostatic maps
Lecture 46 - Designing with kinetoelastic maps
Lecture 47 - Non-dimensinalization of stress, frequency, and other measures
Lecture 48 - Designing compliant suspensions using kinetoelastic maps
Lecture 49 - Instant centre method for designing compliant mechanisms
Lecture 50 - Stiffness and compliance ellipsoids
Lecture 51 - Building block method of designing compliant mechanisms
Lecture 52 - Comparative analysis of different methods for designing compliant mechanisms
Lecture 53 - Aspects of Mechanical advantage of compliant mechanisms
Lecture 54 - Mechanical advantage of rigid-body and compliant mechanisms
Lecture 55 - Bistability in elastic systems
Lecture 56 - Analysis of bistable arches
Lecture 57 - Compliant mechanisms with bistable arches
Lecture 58 - Static balancing and zero-free-length springs
Lecture 59 - Static balance of a compliant mechanism using a linkage
Lecture 60 - Static balancing method for compliant mechanisms
Lecture 61 - A catalogue of compliant mechanisms
Lecture 62 - Compliant suspension mechanism in microsystems (MEMS)
Lecture 63 - Micromechanical signal processors using compliant mechanisms
Lecture 64 - A few special concepts of compliant mechanisms
Lecture 65 - Materials and prototyping of compliant mechanisms
Lecture 66 - Summary of the course
Lecture 67 - Micromachined accelerometers with Displacement-amplifying Compliant Mechanisms (DaCMs)
Lecture 68 - Miniature compliant mechanisms as cell-manipulation tools

NPTEL Video Course - Mechanical Engineering - NOC:Heat Transfer and Combustion in Multiphase Systems

Subject Co-ordinator - Prof. Saptarshi Basu

Co-ordinating Institute - IISc - Bangalore

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

NPTEL Video Course - Mechanical Engineering - NOC:Convective Heat Transfer (2018)

Subject Co-ordinator - Prof. Saptarshi Basu

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - Scaling analysis - II
Lecture 31 - Integral solution
Lecture 32 - Similarity solution
Lecture 33 - Uniform wall heat flux
Lecture 34 - Thermal stratification
Lecture 35 - Mixed convection
Lecture 36 - Internal natural convection - Scaling analysis
Lecture 37 - Heat transfer regimes
Lecture 38 - Regime III
Lecture 39 - Regime IV - Shallow enclosure limit - I
Lecture 40 - Regime IV - Shallow enclosure limit - II
Lecture 41 - Partially divided enclosures
Lecture 42 - Inclined enclosures
Lecture 43 - Natural convection - Tutorial I
Lecture 44 - Natural convection - Tutorial II
Lecture 45 - Introduction to Turbulence
Lecture 46 - Reynoldâ s Averaged Navier Stokes equation - I
Lecture 47 - Reynoldâ s Averaged Navier Stokes equation - II
Lecture 48 - Turbulent boundary layer - Viscous sub layer
Lecture 49 - Turbulent boundary layer - Fully turbulent sub layer
Lecture 50 - Heat transfer in turbulent boundary layer
Lecture 51 - Turbulent internal flow - I
Lecture 52 - Turbulent internal flow - II
Lecture 53 - Turbulent internal flow - III
Lecture 54 - K - Îµ model
Lecture 55 - Turbulence - Tutorial
Lecture 56 - Experimental techniques - Thermochromic liquid crystals
Lecture 57 - Experimental techniques - IR thermography
Lecture 58 - Droplet evaporation - Sessile I
Lecture 59 - Droplet evaporation - Sessile II
Lecture 60 - Droplet evaporation - Contact free

NPTEL Video Course - Mechanical Engineering - NOC:A Short Lecture series on Contour Integration in the Comple

Subject Co-ordinator - Prof. Venkata Sonti

Co-ordinating Institute - IISc - Bangalore

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

NPTEL Video Course - Mechanical Engineering - NOC:Introduction to Soft Matter

Subject Co-ordinator - Prof. Aloke Kumar

Co-ordinating Institute - IISc - Bangalore

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

NPTEL Video Course - Mechanical Engineering - NOC:Robotics: Basics and Selected Advanced Concepts

Subject Co-ordinator - Prof. Ashitava Ghosal

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - Recursive Formulations of Dynamics of Manipulators
Lecture 31 - Motion planning
Lecture 32 - Control of a single link
Lecture 33 - Control of a multi-link serial manipulator
Lecture 34 - Control of a multi-link manipulator
Lecture 35 - Control of constrained and parallel manipulator, Cartesian control of serial manipulators
Lecture 36 - Force control of manipulators, Hybrid position/force control of manipulators
Lecture 37 - Advanced topics in non-linear control of manipulators
Lecture 38 - Wheeled Mobile Robots (WMR) on Flat Terrain
Lecture 39 - Wheeled Mobile Robots (WMR) on Uneven Terrain
Lecture 40 - Kinematics and Dynamics of WMR on Uneven Terrain
Lecture 41 - Over-Constrained Mechanism and Deployable Structures
Lecture 42 - Kinematic and Static Analysis

NPTEL Video Course - Mechanical Engineering - NOC:Sound and Structural Vibration

Subject Co-ordinator - Prof. Venkata R. Sonti

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - Derivation of vibro-acoustic response (Continued...)
Lecture 31 - Numerical example
Lecture 32 - Coupled resonance analysis using matrices
Lecture 33 - Coupled resonance analysis (Continued...)
Lecture 34 - Sound radiation from a baffled panel
Lecture 35 - Derivation of pressure response.
Lecture 36 - Radiation efficiency
Lecture 37 - Physics of volume velocity cancellation
Lecture 38 - Derivations in the frequency domain: 1-D
Lecture 39 - Physics of the vibration spectrum in 2-D
Lecture 40 - Modal character across the frequency range
Lecture 41 - Simultaneous radiation from several modes
Lecture 42 - Panel radiation model using monopoles
Lecture 43 - Physics of panel radiation using monopole model
Lecture 44 - Physics of panel radiation using monopole model (Cointinued...)
Lecture 45 - Radiation resistance derivation from Maidanikâ s work (Continued...)
Lecture 46 - Radiation resistance derivation from Maidanikâ s work (Continued...)
Lecture 47 - Radiation resistance derivation from Maidanikâ s work (Continued...)
Lecture 48 - Modal average radiation efficiency
Lecture 49 - Modal average radiation efficiency (Cointinued...)
Lecture 50 - Transmission of sound through a rigid panel with flexible mounts
Lecture 51 - Frequency dependence of sound transmission
Lecture 52 - Sound transmission through a flexible partition
Lecture 53 - Transmission loss in different situations
Lecture 54 - Cylindrical shell vibration
Lecture 55 - Behavior of uncoupled shell waves
Lecture 56 - Fluid waves in rigid-walled cylindrical shells
Lecture 57 - Wave propagation characteristics in flexible cylindrical shells carrying fluid: Fullers paper
Lecture 58 - Wave impedance of an infinite plate: fluid loading
Lecture 59 - Fluid loading in a finite plate
Lecture 60 - Summary of the entire course

NPTEL Video Course - Mechanical Engineering - NOC:Vibrations of Plates and Shells

Subject Co-ordinator - Prof. Venkata R. Sonti

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - Details of vibrating rings
Lecture 31 - Insights into vibrations of ring
Lecture 32 - Cylindrical shell equations of motion using Force balance
Lecture 33 - Cylindrical shell: Transverse equation of motion
Lecture 34 - Orthogonality of modeshapes
Lecture 35 - Orthogonality of Modes (Continued...)
Lecture 36 - The Rayleigh Quotient
Lecture 37 - Rayleigh Quotient Example: Simply-supported beam
Lecture 38 - The Rayleigh Ritz method
Lecture 39 - The Rayleigh Ritz method applied to a Complicated system
Lecture 40 - The Lagrange Multiplier method
Lecture 41 - The penalty method
Lecture 42 - Orthogonal polynomials of RB Bhat
Lecture 43 - Rayleigh Ritz paper by RB Bhat
Lecture 44 - Numerical examples of the Rayleigh Ritz method
Lecture 45 - Numerical examples of Rayleigh Ritz method And animations
Lecture 46 - Raylegh Ritz applied to curved structures
Lecture 47 - Forced response of plates and shells
Lecture 48 - Forced response (Continued...)
Lecture 49 - Simply-supported plate response to various forces
Lecture 50 - Simply-supported plate response to various Forces (Continued...)
Lecture 51 - Simply-supported cylindrical shell response to a Point harmonic force
Lecture 52 - Cylindrical shell response (Continued...)
Lecture 53 - Cylindrical shell response (Continued...)
Lecture 54 - Cylindrical shell response to a traveling load using Only transverse modes
Lecture 55 - The Receptance method
Lecture 56 - The receptance method (Continued...)
Lecture 57 - Stiffening a cylindrical shell using rings
Lecture 58 - Stiffening of a cylindrical shell (Continued...)
Lecture 59 - Damping in structures
Lecture 60 - Loss factor and Complex Young modulus

NPTEL Video Course - Mechanical Engineering - NOC:Dynamics and Control of Mechanical Systems

Subject Co-ordinator - Prof. Ashitava Ghosal

Co-ordinating Institute - IISc - Bangalore

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

NPTEL Video Course - Mechanical Engineering - NOC:Optical Methods for Solid and Fluid Mechanics

Subject Co-ordinator - Prof. Aloke Kumar, Prof. Koushik Viswanathan

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - Introduction to Photoelasticity
Lecture 31 - Why do we see fringes ?
Lecture 32 - How does light interact with matter ?
Lecture 33 - Origin of Birefringence
Lecture 34 - Loaded sample in a polarizer
Lecture 35 - Stress-induced birefringence
Lecture 36 - Analyses of optical paths using matrix methods
Lecture 37 - Putting it all together
Lecture 38 - What is tomography ?
Lecture 39 - Signal processing and Fourier methods
Lecture 40 - Rays and the Radon transforms
Lecture 41 - Geometric interpretations
Lecture 42 - The inverse problem: From Radon transform to 2D cross-section
Lecture 43 - Cone beams, parallel beams and the Feldkamp algorithm

NPTEL Video Course - Mechanical Engineering - NOC:Statistical Thermodynamics for Engineers

Subject Co-ordinator - Prof. Saptarshi Basu

Co-ordinating Institute - IISc - Bangalore

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

Lecture 30 - The Internal Motion for a two particle system
Lecture 31 - The rotational and vibrational energy mode for a diatomic molecule
Lecture 32 - Hermite polynomials as vibrational energy mode solution
Lecture 33 - Equivalent two body model of atomic hydrogen
Lecture 34 - The Electronic Energy Mode for Atomic Hydrogen
Lecture 35 - Problem Solving - 3
Lecture 36 - The four quantum numbers and multielectron systems
Lecture 37 - Spectroscopic term symbols for multielectron atoms
Lecture 38 - Electron energies for multielectron systems
Lecture 39 - Combined energy modes for atoms and diatomic molecules
Lecture 40 - Perturbation analysis of the Schrodinger Wave equation
Lecture 41 - Selection rules
Lecture 42 - The Rotational and vibrational spectroscopy
Lecture 43 - Ro-vibrational spectroscopy (Simplex model)
Lecture 44 - Rotation vibration coupling (Complex model)
Lecture 45 - Ro-vibrational spectroscopy (Complex model)
Lecture 46 - Ro-vibronic spectroscopy
Lecture 47 - Working with Spectroscopic Schemes, Notations and Term Symbols
Lecture 48 - From Particles to assembly - I
Lecture 49 - From Particles to assembly - II
Lecture 50 - Connecting Quantum Mechanics to Classical Mechanics
Lecture 51 - The Equipartition principle and ideal gas
Lecture 52 - Thermodynamic properties of ideal monoatomic and diatomic gas
Lecture 53 - The zero of energy (rotational and vibrational)
Lecture 54 - Specific heats, Internal energy through Vibrational and Ro-vibrational energy modes
Lecture 55 - The Ro-vibrational partition function and Introduction to intersction of Radiationand Matter
Lecture 56 - Absorption and Emission of Radiation
Lecture 57 - The Rabi frequency and Beer's Law
Lecture 58 - Insights into radiative spectral transitions
Lecture 59 - Theory of Absoprtion Spectroscopy