

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

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 1 - Preliminary concepts  
Lecture 2 - Fluid Kinematics  
Lecture 3 - Derivation of incompressible Navier-Stokes equations  
Lecture 4 - Initial and Boundary Conditions  
Lecture 5 - Plane Couette Flow  
Lecture 6 - Plane Poiseuille Flow  
Lecture 7 - Plane Poiseuille Flow with Slip and Thin Film Flow  
Lecture 8 - Combined Couette - Poiseuille Flow  
Lecture 9 - Example Problems  
Lecture 10 - Hagen - Poiseuille Flow  
Lecture 11 - Thin Film Flow and Annular Flow  
Lecture 12 - Steady Flow Between Rotating Cylinders  
Lecture 13 - Flow near a plate suddenly set in motion  
Lecture 14 - Flow due to an oscillating plate  
Lecture 15 - Transient Plane Couette Flow  
Lecture 16 - Transient Axisymmetric Poiseuille Flow  
Lecture 17 - Flow Through Rectangular Duct  
Lecture 18 - Flow Through Equilateral Triangular Duct  
Lecture 19 - Flow Through Elliptical Duct  
Lecture 20 - Example Problems  
Lecture 21 - Creeping Flow Around a Sphere  
Lecture 22 - Reynolds Equation for Lubrication  
Lecture 23 - One-dimensional Slider Bearing  
Lecture 24 - Journal Bearing and Piston-ring Lubrication  
Lecture 25 - Derivation of Boundary Layer Equations  
Lecture 26 - Blasius Flow Over A Flat Plate: Similarity Solution  
Lecture 27 - Momentum Integral Equation For Flat Plate Boundary Layer  
Lecture 28 - Falkner-Skan equation: Boundary layer flow over a wedge  
Lecture 29 - Karman-Pohlhausen Method for Non-zero Pressure Gradient Flows

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- 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