

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

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 1 - Applications of CFD
- Lecture 2 - Basic equations of fluid dynamics and heat transfer
- Lecture 3 - Initial and boundary conditions
- Lecture 4 - Physical Classification, System of first-order PDEs
- Lecture 5 - System of second-order PDEs
- Lecture 6 - Finite difference by Taylor series expansion
- Lecture 7 - Finite difference by general approximation and polynomials
- Lecture 8 - Finite difference in non-uniform grid
- Lecture 9 - Types of error and accuracy of FD solutions
- Lecture 10 - Finite difference formulations of Elliptic Equations with boundary condition treatment
- Lecture 11 - Iterative Methods
- Lecture 12 - Applications
- Lecture 13 - Linear Solvers
- Lecture 14 - Finite difference formulations of Parabolic Equations
- Lecture 15 - Finite difference formulations of Parabolic Equations
- Lecture 16 - Finite difference formulations of Parabolic Equations
- Lecture 17 - Finite difference formulations of Parabolic Equations
- Lecture 18 - Finite difference formulations of the first order wave equation
- Lecture 19 - Finite difference formulations of the first order wave equation
- Lecture 20 - Von Neumann stability analysis of different schemes for Parabolic equations
- Lecture 21 - Von Neumann stability analysis of different schemes for Parabolic equations
- Lecture 22 - Von Neumann stability analysis of different schemes for Hyperbolic equations
- Lecture 23 - Modified equation, Artificial viscosity, Numerical diffusion
- Lecture 24 - Discretization vorticity-stream function equations using FDM
- Lecture 25 - Boundary conditions for flow problems
- Lecture 26 - Solutions of vorticity-stream function equations
- Lecture 27 - Solution of Navier-Stokes Equation using FDM
- Lecture 28 - Solution of Navier-Stokes Equation using FDM (Continued...)
- Lecture 29 - Introduction to finite volume method

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- 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