

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

NPTEL Video Course - Mechanical Engineering - NOC:Turbulence Modeling

Subject Co-ordinator - Prof. Vagesh D. Narasimhamurthy

Co-ordinating Institute - IIT - Madras

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

- Lecture 1 - Introduction to turbulence
- Lecture 2 - Statistical Analysis: An approach of modelling turbulence - I
- Lecture 3 - Statistical Analysis: An approach of modelling turbulence - II
- Lecture 4 - Statistical Analysis and Cartesian tensors - I
- Lecture 5 - Statistical Analysis and Cartesian tensors - II
- Lecture 6 - Navier Stokes: the governing equations - 1
- Lecture 7 - Navier Stokes: the governing equations - 2
- Lecture 8 - RANS equations I - 1
- Lecture 9 - RANS equations I - 2
- Lecture 10 - RANS equations II - 1
- Lecture 11 - RANS equations II - 2
- Lecture 12 - Reynold's stress: governing equations - I
- Lecture 13 - Reynold's stress: governing equations - II
- Lecture 14 - Statistical Stationarity and Homogeneity in Plane Couette Flows - I
- Lecture 15 - Statistical Stationarity and Homogeneity in Plane Couette Flows - II
- Lecture 16 - Pressure-strain-rate and redistribution of turbulence in flows - I
- Lecture 17 - Pressure-strain-rate and redistribution of turbulence in flows - II
- Lecture 18 - Turbulence Kinetic Energy and it's dissipation rate - I
- Lecture 19 - Turbulence Kinetic Energy and it's dissipation rate - II
- Lecture 20 - Production rate of TKE and Mean TKE - I
- Lecture 21 - Production rate of TKE and Mean TKE - II
- Lecture 22 - Turbulent Boundary Layer: Order of Magnitude analysis - I
- Lecture 23 - Turbulent Boundary Layer: Order of Magnitude analysis - II
- Lecture 24 - Inner and Outer TBL: Order of magnitude analysis - I
- Lecture 25 - Inner and Outer TBL: Order of magnitude analysis - II
- Lecture 26 - Inner layer equation, constant stress layer, and inner velocity scaling - I
- Lecture 27 - Inner layer equation, constant stress layer, and inner velocity scaling - II
- Lecture 28 - Reynold's Averaged Navier-Stokes (RANS) models - I
- Lecture 29 - Reynold's Averaged Navier-Stokes (RANS) models - II

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- Lecture 30 - Different approaches to solve turbulence closure problem - I
- Lecture 31 - Different approaches to solve turbulence closure problem - II
- Lecture 32 - Modelling of turbulent kinetic energy (k): production, destruction, and dissipation rate - I
- Lecture 33 - Modelling of turbulent kinetic energy (k): production, destruction, and dissipation rate - II
- Lecture 34 - Standard k- ϵ model and the model constants - I
- Lecture 35 - Standard k- ϵ model and the model constants - II
- Lecture 36 - Standard k- ϵ model, RNG k- ϵ model, and Prandtl's one equation model - I
- Lecture 37 - Standard k- ϵ model, RNG k- ϵ model, and Prandtl's one equation model - II
- Lecture 38 - New model k- ϵ and model constants - I
- Lecture 39 - New model k- ϵ and model constants - II
- Lecture 40 - Introduction to wall-functions - I
- Lecture 41 - Introduction to wall-functions - II
- Lecture 42 - Introduction to wall-resolved simulations - I
- Lecture 43 - Introduction to wall-resolved simulations - II
- Lecture 44 - Damping functions for LRN - I
- Lecture 45 - Damping functions for LRN - II
- Lecture 46 - Boundary and Initial conditions for RANS simulations - I
- Lecture 47 - Boundary and Initial conditions for RANS simulations - II
- Lecture 48 - Realizability constraints in eddy-viscosity models - I
- Lecture 49 - Realizability constraints in eddy-viscosity models - II
- Lecture 50 - Correctors for eddy-viscosity models - I
- Lecture 51 - Correctors for eddy-viscosity models - II
- Lecture 52 - Reynolds Stress Modelling (RSM): governing equations - I
- Lecture 53 - Reynolds Stress Modelling (RSM): governing equations - II
- Lecture 54 - Dissipation rate and Pressure-Strain rate modelling for RSM - I
- Lecture 55 - Dissipation rate and Pressure-Strain rate modelling for RSM - II
- Lecture 56 - Pressure-Strain rate modelling for RSM - I
- Lecture 57 - Pressure-Strain rate modelling for RSM - II
- Lecture 58 - Pressure-Strain rate modelling and wall corrections for RSM - I
- Lecture 59 - Pressure-Strain rate modelling and wall corrections for RSM - II
- Lecture 60 - Introduction to Eddy Resolved Models - I
- Lecture 61 - Introduction to Eddy Resolved Models - II
- Lecture 62 - Introduction to Direct Numerical Simulations (DNS) - I
- Lecture 63 - Introduction to Direct Numerical Simulations (DNS) - II
- Lecture 64 - Introduction to Large Eddy Simulations (LES) Filtering operation and SGS stresses - I
- Lecture 65 - Introduction to Large Eddy Simulations (LES) Filtering operation and SGS stresses - II
- Lecture 66 - Large Eddy Simulations: Filtered Navier-Stokes Equations - I
- Lecture 67 - Large Eddy Simulations: Filtered Navier-Stokes Equations - II
- Lecture 68 - Large Eddy Simulations: Filters and its types - I

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- Lecture 69 - Large Eddy Simulations: Filters and its types - II
- Lecture 70 - Large Eddy Simulations: Smagorinsky model - I
- Lecture 71 - Large Eddy Simulations: Smagorinsky model - II
- Lecture 72 - LES: Dynamic Smagorinsky model and Scale similarity models - I
- Lecture 73 - LES: Dynamic Smagorinsky model and Scale similarity models - II
- Lecture 74 - Numerics in LES and Hybrid models