Instability and Transition of Fluid Flows - Video course

COURSE DETAIL

Modules	Topic
1	**Introduction to Instability and Transition**

	1. Introduction
	2. What Is Instability?
	3. Temporal and Spatial Instability
	4. Some Instability Mechanisms
	    1. Dynamic Stability of Still Atmosphere
	    2. Kelvin–Helmholtz Instability

2	**Computing Transitional and Turbulent Flows**
	2.1 Fluid Dynamical Equations 2.1.1 Equation of Continuity 2.1.2 Momentum Conservation Equation 2.1.3 Energy Conservation Equation 2.1.4 Alternate Forms of the Energy Equation 2.1.5 Equations of Motion in Terms of Derived Variables
	2.2 Some Equilibrium Solutions of the Basic Equation 2.2.1 Couette Flow between Parallel Plates 2.2.2 Flow between Concentric Rotating Cylinders 2.2.3 Couette Flow between Parallel Plates, Driven by Pressure 2.2.4 Steady Stagnation Point Flow 2.2.5 Flow Past a Rotating Disc
	2.3 Boundary Layer Theory
	2.4 Control Volume Analysis of Boundary Layers 2.4.1 Displacement Thickness 2.4.2 Momentum Thickness 2.4.3 Separation of a Steady Boundary Layer 2.5 Numerical Solution of the Thin Shear Layer (TSL) Equation 2.5.1 Falkner–Skan Similarity Profile 2.5.2 Separation Criterion for Wedge Flow 2.5.3 Blasius Profile 2.5.4 Hiemenz or Stagnation Point Flow
	2.6 Laminar Mixing Layer 2.7 Plane Laminar Jet

NPTEL

http://nptel.iitm.ac.in

Aerospace Engineering

Coordinators:

Prof. Tapan K. Sengupta
Department of Aerospace EngineeringIIT Kanpur