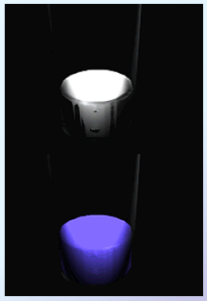
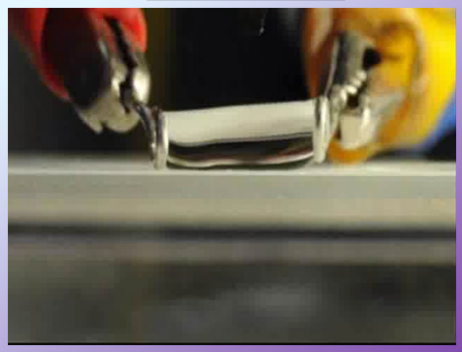
Course Overview

I. Introduction

II. Basic concepts
- Definition of a fluid
- Continuum and fields
- Dimensions and units
- Fluid properties
  - Density
  - Viscosity
  - …
  - Surface tension





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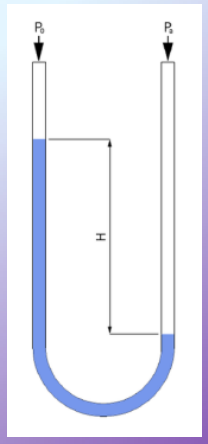
I. Introduction

II. Basic concepts

III. Fluid statics

- Pressure field
- Pressure variation in a fluid at rest
- Pressure measurement
  - Manometers
  - ...



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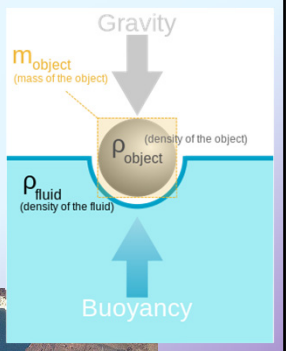
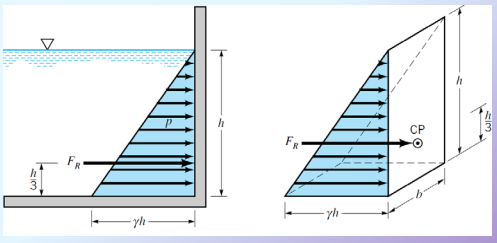
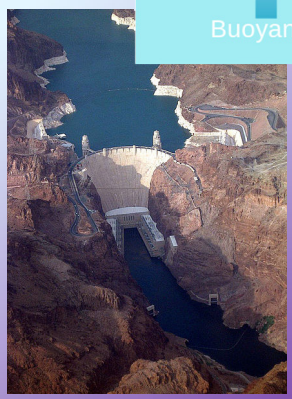
- Pressure field
- Pressure variation in a fluid at rest
- Pressure measurement
- Hydrostatic force on a surface







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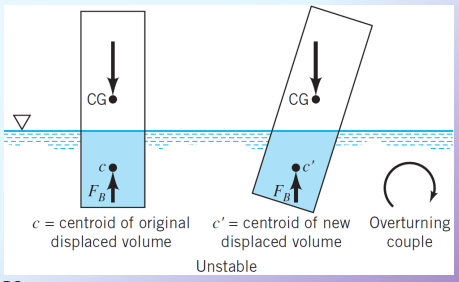
- Pressure field
- Pressure variation in a fluid
- Pressure measurement
- Hydrostatic force on a surface
- Buoyancy, flotation, and stability
- Rigid-body like motion



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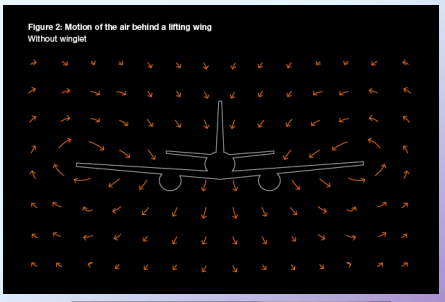
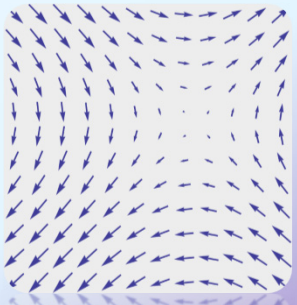
IV. Fluid kinematics
- Velocity field





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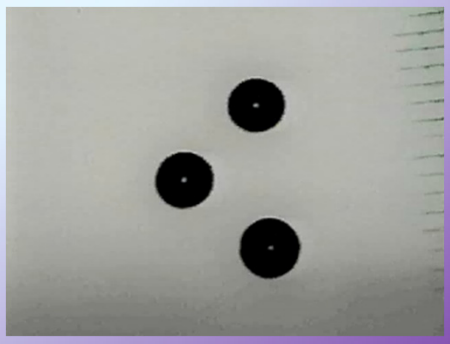
IV. **Fluid kinematics**
- Velocity field
- Acceleration field
- Eulerian vs. Lagrangian
- Streamlines, streaklines, and pathlines



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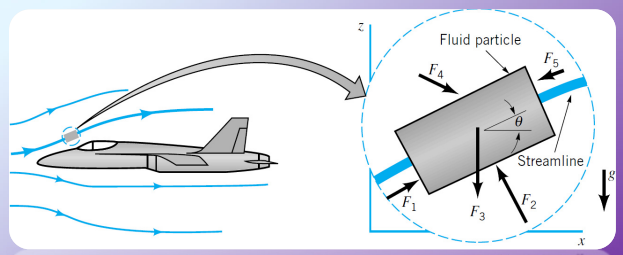
IV. Fluid kinematics
V. **Bernoulli equation**
- Newton's second law on a streamline
- Applications



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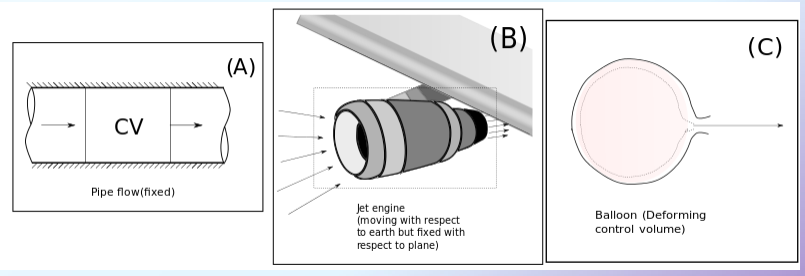

VI. **Fundamental principles**

- Conservation laws
- Control volume and system
- Reynolds transport theorems

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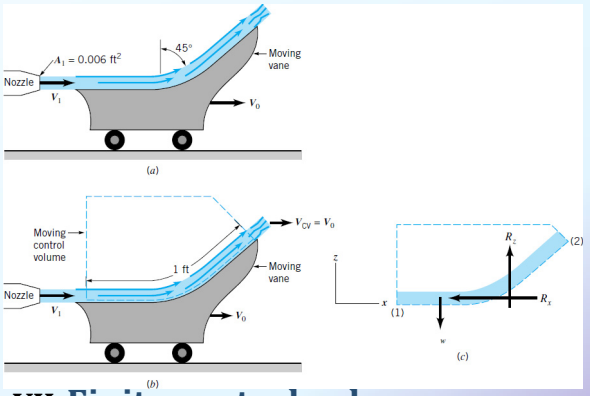

VII. **Finite control volume**

- Conservation of mass
- Conservation of momentum
- Conservation of energy

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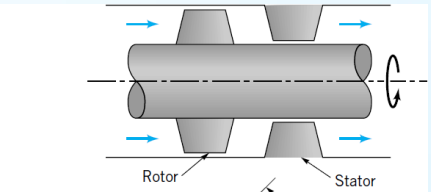
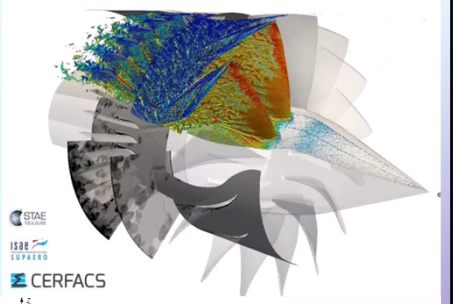
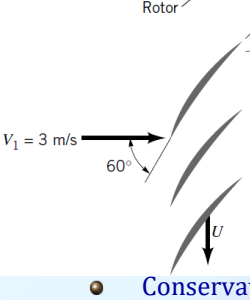
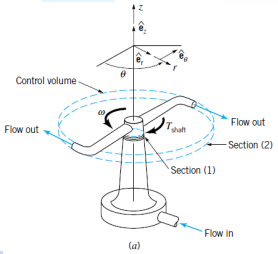
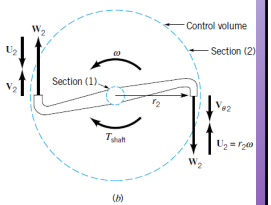


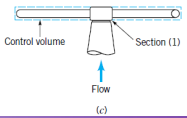




Arithmetic mean radius blade sections







- Conservation of mom
- Conservation of energ

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VI. Fundamental principles
VII. Finite control volume

VIII. Dimensional analysis and similarity
- Buckingham Pi theorem
- Dimensionless parameters
- Similitude

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The end of chapter 1