Syllabus

ME 0075 – Introduction to Fluid Mechanics

Fall Semester 2022

Lecture Time:	Thu. 08:15 – 11:00	**Instructor:**	Dr. John Pien
Classroom:	4-202	**Office:**	3-223
Office Hours:	Wed. 14:00 – 17:00	**Email:**	john.pien@scupi.cn

Teaching Assistant: Litao Liu **Email:** 2019141520065@stu.scu.edu.cn

Catalog Description:

This 3-credit course is an introduction into the study of fluid statics and dynamics to provide an understanding of the basic concepts that relate to fluid mechanics and fluid systems. Topics covered will include hydrostatics, flow kinematics, control volume analysis, Navier-Stokes equations, inviscid flow and incompressible viscous flow. Prerequisite: *PHYS 0174, ENGR 0145, MATH 0290*.

Required Textbook:

Pritchard and Mitchell, *Fox and McDonald's Introduction to Fluid Mechanics*, 9th Edition, Wiley.

Additional References:

Cengel and Cimbala, *Fluid Mechanics Fundamentals and Applications*, McGraw-Hill.

Course Outcomes:

- Develop an understanding for fluids at rest and apply them to engineering applications.
- Apply the conservation of momentum to fluids in motion.
- Apply the conservation of energy for fluids in motion.
- Define and describe Reynold's number and how to calculate it.
- Apply differential equation solutions to fluid in motion applications.
- Define and understand laminar and turbulent flow conditions and how to apply relation to solve engineering applications.

Course Outline:

- Introduction (Ch. 1)
- Fundamental Concepts (Ch. 2)
- Fluid Statics (Ch. 3)
- Basic Equations in Integral Form for a Control Volume (Ch. 4)
- Introduction to Differential Analysis of Fluid Motion (Ch. 5)
- Incompressible Inviscid Flow (Ch. 6)
- Dimensional Analysis and Similitude (Ch. 7)
- Internal Incompressible Viscous Flow (Ch. 8)

Course Grading:

Homework	15%
Quiz	5%
Exam I	20%
Exam II	25%
Final Exam	35%

Exam Schedule:

Exam I	Oct. 20th
Exam II	Nov. 24th
Final	Dec. 29th