ME 0071: Introduction to Fluid Dynamics

(Modifications to this syllabus may be required during the semester. Any changes to the syllabus will be posted on the course website and announced in class)

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Office Hours: Thursdays 9am-10am Room 3-105

Lecture Times:
Tuesdays 1:50pm-4:25pm, Room 3-102

Catalog Description: 3 Credits; this course is an introduction into the study of fluid 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. Prerequisites: PHYS 0174, ENGR 0145, MATH 0290.

Required Text:
Fox and McDonald's Introduction to Fluid Mechanics, 8th Edition, Pritchard. International Student Version

Additional Text:
Fluid Mechanics Fundamentals and Applications, Cengel and Cimbala

Course Objectives:

- Develop an understanding for fluids at rest and apply them to engineering applications.
- How to apply the conservation of energy for fluids in motion.
- How to apply the conservation of momentum to 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:

Part 1:
Introduction (Ch. 1)
Fundamental Concepts (Ch. 2)
Fluid Statics (Ch. 3)
Flow Kinematics (Ch. 4)
Part 2:
Differential Analysis of Fluid Flow (Ch. 5)
Inviscid Flow (Ch. 6)
Part 3:
Dimensional Analysis (Ch. 7)
Internal Incompressible Viscous Flow (Ch. 8)

Examination Schedule:

Exam I on Tuesday October 27th
Exam II on Tuesday December 8th
Final Exam on Tuesday January 5th

Exams will be during normal lecture time.

Course Grading:

Homework	10%
In Class Studios	20%
Exam I	20%
Exam II	20%
Final Exam	30%

Grading Scale: The official SCU/SCUPI grading scale will be used when determining final grades and numerical scores based on a student's course average. An additional curve may be applied, as determined by the overall final grade distribution of the class. Grades of A-, B+, B-, etc. will be determined at the instructor's discretion.

Course Schedule:

Week 1	September 1st
	No Class
Week 2	September 8th
	Course Introduction, Ch.1 and Ch.2
Week 3	September 15th
	Ch. 3
Week 4	September 22nd
	Ch. 3
Week 5	September 29th
	Ch. 4
Week 6	October 6th
	No Class/Holiday
Week 7	October 13th
	Ch. 4
Week 8	October 20th
	Test 1 Review
Week 9	October 27th
	Test 1
Week 10	November 3rd
	Ch. 5
Week 11	November 10th
	Ch. 5
Week 12	November 17th
	Ch. 6
Week 13	November 24th
	Ch. 6
Week 14	December 1st
	Test 2 Review
Week 15	December 8th
	Test 2
Week 16	December 15th

	Ch. 7
Week 17	December 22nd
	Ch. 8
Week 18	December 29th
	Ch. 8/Final Review
Week 19	January 5th
	Final Exam
Week 20	January 12th
	Final Grades Posted on BB
Week 21	January 19th
	End of Semester

Class Policies: Regular class attendance is expected and encouraged. Each student is responsible for all of the material presented in class and in the reading assignments. Exams will emphasize treatment of material covered in lectures. In general, no late assignments will be accepted or makeup exams given. Exceptions will be made for a valid excuse consistent with University Policy. If you cannot attend an exam or meet a due date, you must contact the instructor prior to the exam or due date. Arrangements will be made for students on a case by case basis. (Failure to contact the instructor prior to the exam or assignment due date will result in a zero on that exam/assignment.)

Academic Integrity Policy: "Violations of academic integrity include, but are not limited to, cheating, plagiarism, or misrepresentation in oral or written form. Such violations will be dealt with severely, in accordance with University policy. Plagiarism means representing someone else's idea or writing as if it were your own. If you use someone else's ideas or writing, be sure the source is clearly designated." It is expected that students adhere to the academic integrity policy that is presented in the Student's Honor Code of Conduct / Student Handbook.