ME 0071: Introduction to Fluid Mechanics

(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)

Instructor: Chander Prakash, Ph.D.
Mechanical Engineering Faculty
Office: 4-227
Email: chander.prakash@scupi.cn
Office Hours: Mondays, Tuesdays and Wednesdays 12:45pm-13:45pm

Teaching Assistant: Charles (Wang Lujia)
Email: wanglu_jia@foxmail.com

Lecture Times:
Tue. 13:50 - 16:25 PM @ Room 102, Zone 3 (45 mins per session, 3 sessions in a row)

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:
Fluid Mechanics, 9th Edition, SI Version – Fox, McDonald, Pritchard, Mitchell

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:
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)

Examination Schedule:
Exam I on Tuesday October 15th
Exam II on Tuesday November 26th
Final Exam on Tuesday December 31st
Exams will be held during normal lecture time.

Course Grading:
- Homework: 20% … *Short Quiz during each lecture based on homework assigned in previous lecture*
- Exam I: 20%
- Exam II: 20%
- Final Exam: 40%

Grading Scale: A 10-point scale will be used as a baseline for final grades (A, A- > 90, 89 > B+, B, B- >80, etc.). 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.

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.

Week #	Date	Lecture # & Homework #	Chapters Covered	Quiz # / Based on Homework #
1	Sep - 03	1	1 & 2	-
2	Sep - 10	2	3	1 / 1
3	Sep - 17	3	3	2 / 2
4	Sep - 24	4	4	3 / 3
5	Oct - 01	No Class	-	-
6	Oct - 08	Test 1 Review	-	4 / 4
7	Oct - 15	Test 1	-	-
8	Oct - 22	5	4	-
9	Oct - 29	6	4	5 / 5
10	Nov - 05	7	5	6 / 6
11	Nov - 12	8	6	7 / 7
12	Nov - 19	Test 2 Review	-	8 / 8
13	Nov - 26	Test 2	-	-
14	Dec - 03	9	7	-
15	Dec - 10	10	8	9 / 9
16	Dec - 17	11	8	10 / 10
17	Dec - 24	Final Exam Review	-	11 / 11
18	Dec - 31	Final Exam	-	-