ME 0071 – Introduction to Fluid Mechanics

Fall Semester 2021

Lecture Times:	R 8:15~11:00 am	**Instructor:**	Dr. Jin Xu
Classroom:	3-311	**Office:**	4-219
Office Hours:	M&T 4:30~5:30 pm	**Email:**	jin.xu@scupi.cn

Teaching Assistant: TBA. **Email:** TBA.

Catalog Description:

This 3-credit 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. Prerequisite: *PHYS 0174, ENGR 0145, MATH 0290*.

Course Outcomes:

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

Required Textbook:

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

Additional Reference:

Cengel and Cimbala, *Fluid Mechanics Fundamentals and Applications*.

Course Policies:

Regular class attendance is expected. 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 make-up exams will be 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. (Failure to do so will result in a zero on that exam/assignment.) Arrangements will be made for students on a case-by-case basis.

Integrity and Academic Expectations:

"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.

Grading Policy:

Exams 1 & 2 = 20% each, Final = 30%, Homework = 15%, and Labs = 15%. Please go to Grade Center on BB for up-to-date grades. Grades will ***not*** be curved, and the official SCU grading scale will be used when determining your final letter grade (based on the numerical grade).

Exam Schedule:

Exam 1: Oct. 21th, Exam 2: Nov. 25th, and Final: Dec. 30th.

Tentative Course Schedule:

Week	Date	Chapter
1	9/2	Course Overview (1 & 2)
2	9/9	Fluid Statics (3)
3	9/16	Fluid Statics (3)
4	9/23	Flow Kinematics (4)
5	9/30	Flow Kinematics (4)
6	10/7	No Class – National Day
7	10/14	Exam Review
8	10/21	**Exam #1**
9	10/28	Differential Analysis of Fluid (5)
10	11/4	Differential Analysis of Fluid (5)
11	11/11	Incompressible Inviscid Flow (6)
12	11/18	Incompressible Inviscid Flow (6)
13	11/25	**Exam #2**
14	12/2	Dimensional Similitude (7)
15	12/9	Internal Flow (8)
16	12/16	Internal Flow (8)

17	12/23	Exam Review
18	12/30	**Final Exam**
19	1/6	Final Grades Posted on BB
20	1/13	End of Semester