

Syllabus

ME 1071 – Applied Fluid Mechanics

Fall Semester 2021

Lecture Times:	T 1:50~4:25 pm	Instructor:	Dr. Jin Xu
Classroom:	4-201	Office:	4-219
Office Hours:	M&T 4:30~6 pm	Email:	jin.xu@scupi.cn

Teaching Assistant: Allen Wang (Yi Wang). **Email:** 2018141521034@stu.scu.edu.cn.

Catalog Description:

This 3-credit course is an advanced mechanical engineering approach to the study of fluid flow and fluid systems. Topics covered will include internal and external flow conditions for system design and implementation, fluid machinery, open channel flow and compressible flow conditions. Students will also be introduced to CFD for Navier-Stokes solutions to fluid applications. Prerequisite: *ME 0071*.

Course Outcomes:

- Apply differential equation solutions to fluid in motion applications.
- Develop an advanced understanding of fluid motion and apply them to engineering applications.
- Applying fluid flow characteristics to internal and external flow conditions
- Understand problem solving techniques for potential flow and Navier-Stokes equations.
- Understand compressible flow conditions and engineering applications of gas dynamics.
- Applying advanced fluid flow solution techniques to real world applications (*i.e.* CFD).

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

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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. 19th, Exam 2: Nov. 23rd, and Final: Dec. 28th.

Tentative Course Schedule:

Week	Date	Chapter
1	8/31	Internal Flow (8)
2	9/7	Internal Flow (8)
3	9/14	Internal Flow (8)
4	9/21	No Class – Mid-Autumn Holiday
5	9/28	External Flow (9)
6	10/5	No Class – National Day
7	10/12	External Flow (9)
8	10/19	Exam #1
9	10/26	CFD (5)
10	11/2	CFD (5)
11	11/9	Fluid Machinery (10)
12	11/16	Fluid Machinery (10)
13	11/23	Exam #2
14	11/30	Flow in Channels (11)
15	12/7	Compressible Flow (12)
16	12/14	Compressible Flow (12)

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17	12/21	Exam Review
18	12/28	Final Exam
19	1/4	Project Time
20	1/11	Final Grades Posted on BB