Learning without thinking is useless
Thinking without learning is dangerous
Confucius

Fluid Mechanics, ME 3300
Winter 2005
7.30-9.20 pm Thursday, 5.30-7.20 pm Friday, rm. 0269 Manoogian

Instructor: Professor Victor Berdichevsky
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Tel.: (313) 577-3905
Office Hours: 5-7 pm, Thursday; 1.30-2.30 pm Friday, office;
4.50-5.20 pm, Friday, rm.0256 Manoogian.

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Office Hours: 6-7pm, Thursday; 4.30-5.30pm Friday

Pre-requisites: ME 2400, MAT 2150 with ME2210 as co-requisite or pre-requisite

Web page: see homework assignments and solution to exam problems on Pipeline Blackboard


Useful additional readings:
Course Contents:

1. Reminder from statics of solids and math       6 classes.
2. Basic equations                               3 classes
3. Fluid statics                                 3 classes
4. Applications of the integral form of the basic equations 2 classes
5. Incompressible ideal flows                    2 classes
6. Viscous flows                                 4 classes
7. Dimensional analysis                          3 classes

Experiments:     Lab problems-lecture           1 class
                 Two Lab problems-practical work

Exams: Four closed books/notes mid-term exams and the final exam; the final exam will be on April 28.

Home work: weekly; assignments are due every Thursday

Grading Policy: Grades will be based on home works (10 points total), three (out of four) exams with the best results (maximum 17 points each), 2 lab problems (10 points total) and the final exam (25 points maximum).

Each exam contains a problem discussed in class. The score for this problem (7 points) is set in such a way that a student who got 10 points for home work, 10 points for Lab and solve on each exam only the problems discussed in class can earn a C. To get a credit for a problem discussed in class a student must solve it without flaws. No partial credits for such problems are given.

There will be no make up exams.

Each home work problem is given a score 3 (problem is solved perfectly), 2 (there are some minor flaws in the solution), 1 (problem is not solved but there is a thought deserving a credit) or 0 (problem is not solved or attempted). Zero score is given also if the solution is poorly written. Well written solution is a solution which can be understood by an expert without second -guessing. At the end of the semester it is determined the weight of one home work point from the condition that the maximum score for home work is 10 course points. Then the scores earned by a student are summed up and rounded to a digit in favor of the student.

Students with better than average performance are awarded extra 1 to 4 points. Students who fail the Lab portion of the course fail the whole course.
Lab problems: Each student must perform 2 lab problems. Lab portion of the course starts in February. Everyone must attend the lecture in February (TBA) where the lab problems will be discussed, and the teams will be formed.

Grades vs Points:
- A  more than 80
- A- more than 75
- B+ more than 70
- B  more than 65
- B- more than 60
- C+ more than 55
- C  more than 48
- C- more than 44
- D  more than 40

Less or equal to 40 - failing the course

Specific Learning Objectives: Letters in brackets refer to BSME Program Outcomes A-J. Numbers in brackets refer to the methods of evaluation, with 1=Homework, 2=Quizzes & Exams, 3=Projects & Competitions, 4=Presentations, 5=Lab Reports.

A Student who successfully complete ME3300 will:

- Gain language, knowledge, and concepts of basic fluid mechanics. In particular, given a simple flow condition, the student will be able to estimate its overall flow properties based on flux conservation of mass, momentum and energy, the use of the Bernoulli equation, characteristics of internal and external flows, dimensional analyses, et cetera. [A; 1,2,5] [C; 2,5] [F; 1,2,5] [G; 2]
- Obtain exposure to the analytical description and/or solution of classical flow problems governed by the differential and integral equations. [A; 1,2,5] [C; 2,5] [F; 1,2,5]
- Obtain hands-on experience in conducting flow experiments. [D; 5] [E; 5] [F; 1,2,5] [G; 1,2,5] [I; 5]

Relationship of Course Objectives to BSME Program Outcomes:

Strongly related to the BSME program Objectives that successful students will
(A) be able to understand scientific principles and apply them to the practice of engineering.

(C) possess the problem-solving skills, background and confidence necessary to educate themselves continually throughout their careers.

(D) be able to apply computers as tools for engineering.

(E) be able to apply the basic principles of measurements, data analysis, and design of experiments, learned through “hands-on” laboratory experience.

(F) be able to practice engineering with ethical standards and a responsibilities to society.

(G) be able to develop creative solutions to engineering problems.

**Student Conduct:**
It is the responsibility of each student to adhere to the principles of academic integrity. Academic integrity means that a student is honest with him/herself, fellow students, instructors, and the University in matters concerning his or her educational endeavors. Thus, a student should not falsely claim the work of another as his/her own, or misrepresent him/herself so that the measures of his/her academic performance do not reflect his/her own work or personal knowledge. In this regard, cheating will not be tolerated. Cheating includes (but is not limited to) any communication (written or oral) during examinations and sharing of work, such as using the same models or computer programs or copying work. All homework and projects must be an individual effort unless specifically noted. **STUDENTS WHO CHEAT ON ANY ASSIGNMENT OR DURING ANY EXAMINATION WILL BE ASSIGNED A FAILING GRADE FOR THE COURSE.** Therefore avoid all appearance of improper behavior! Students who witness cheating should report the incident to the instructor as soon as possible. Students are also welcome to discuss any concerns related to cheating with Prof. R. Gibson, Interim Chair of Mechanical Engineering.