CE 218 – MECHANICS OF FLUIDS – Section 001 (52307)  
(Revision: 8 January 2013)

Syllabus and Policy – Spring 2013

MWF 10:00 – 10:50 @ Meinel Optical Sciences 410

Catalog Description: (3 units) Hydrostatics, continuity, irrotational flow, pressure distributions, weirs and gates, momentum and energy, surface drag, pipe friction, form drag, pipe fitting losses.

This course introduces the fundamental principles of fluid mechanics. It is focused on both theoretical background and problem-solving techniques and includes application of these techniques to a wide variety of practical fluid flow problems.

Prerequisite(s): CE 214 Statics (and thus PHYS 141 and MATH 129 or equivalents)

Instructor: Forrest Holly, Adjunct Professor of Civil Engineering and Engineering Mechanics

Office Hours: Mon, Wed 11:00–12:00; Fri 8:30–9:30; 11:00–1:00 in CE 208/214, or other times by appointment

E-mail: forrest-holly@uiowa.edu

Teaching Assistant: Neema Nassir (neeman@email.arizona.edu)

Office Hours: Mon Wed 8-10; Place TBA

Recitation/Discussion Hours: 001A: Tu (3:30–4:20 PM) @ M Pacheco ILC, Rm 135  
001B: Th (3:30–4:20 PM) @ Education, Rm 535  
(Must attend enrolled sect) 001C: Fr (2:00–2:50 PM) @ Elec & Comp Engr, Rm 258

Required Text:


This is a required text, and an account with WileyPLUS is also mandatory for the course. WileyPLUS is used for some of the homework assignments, and occasional quizzes, as well as for direct access to the text and its problems. There are four options for the text and WileyPLUS:

1) Direct purchase of the e-edition from www.wileyplus.com/buy (this is the least expensive option). Search for the course CE 218. Make sure you select the seventh edition of the textbook and not the sixth. Purchase of the e-edition includes WileyPLUS, which is mandatory for this course. (Approximately $80)
2) Binder-ready version from the UA bookstore with WileyPLUS, ISBN 978-1118-413623 (approximately $150)

3) Hardcover version from the UA bookstore with WileyPLUS, ISBN 978-1118-286173 (approximately $225)

4) Used or rented version of 7th Edition, with WileyPLUS purchased separately from www.wileyplus.com

EVALUATION – COURSE GRADING

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Attendance</td>
<td>5%</td>
</tr>
<tr>
<td>Recitation Attendance</td>
<td>5%</td>
</tr>
<tr>
<td>Homework</td>
<td>15%</td>
</tr>
<tr>
<td>Midterm Exams (2)*</td>
<td>40%</td>
</tr>
<tr>
<td>Final Exam*</td>
<td>35%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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</tbody>
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* In the final grade calculation, the exam scores for the entire class will be uniformly adjusted to achieve a target class average.

A summary of numerical homework and exam scores will be posted on D2L after each exam. Please review and notify the instructor for any omission or error before the date of the final examination. No changes will be accepted after the final examination.

Final course grades are assigned by the instructor using the ranked total student scores, with exam scores uniformly adjusted to achieve a target class average. Grades will be assigned as follows:

- > 90% A
- 80% to 89.9% B
- 70% to 79.9% C
- 60% to 69.6% D
- < 60% E

EXAMINATIONS

Both midterm examinations and a final examination are mandatory. Midterm examinations are held during the regular class session in the lecture room assigned to the course. Exams are closed book, but a one-page cheat sheet (both sides), and calculators are permitted. A two-page cheat sheet (both sides) is allowed for the final exam.

**There will be no make-up for unexcused missed examinations.**
Examinations are regarded as an engineering report. Procedures and presentation of solutions should be precise and legible. Points are awarded for:

(I) algebraic and computational accuracy;
(II) answers presented with proper units, sign or direction;
(III) complete and appropriate sketches, where required; and
(IV) clear, logical, and legible presentation.

No credit will be given for correct answers obtained by incorrect reasoning or compensation errors.

Partial credit will be given for work that demonstrates understanding of the concepts leading to the correct solution.

HOMEWORK POLICY

Homework assignments and due dates will be posted in the content area of D2L, about one week in advance of the due date. Homework, assigned in a given week, is due by 5 PM on the announced day. Homework not turned in on time will not be graded. Students must work all assigned problems; a selection of the assigned problems may be randomly selected for detailed grading, but full credit is given only if all assigned problems have been worked in good faith.

Homework problems include book problems and possibly additional problems posted on D2L. Homework assignments may include a combination of problems to be submitted through WileyPLUS; others to be submitted through the dropbox of D2L; and others to be submitted in paper form to a designated box on the second floor of the Civil Engineering building. Paper homework problems must be solved neatly using only one side of engineering paper. (Students can always turn in paper homework early during the regular class period if desired to avoid having to make a special trip to the Civil Engineering building.)

Homework solutions are posted on D2L after they have been graded and returned in discussion section.

RECITATION/DISCUSSION SECTION POLICY

Recitation/Discussion section attendance is mandatory. The Teaching Assistant presents supplementary problem-solving demonstrations, clarifies lecture concepts, and administers random quizzes to check student progress. Students are allowed a maximum two excused absences without any penalty. Absences of more than two sessions will result in losing points proportionately to the number of absences.

LECTURE ATTENDANCE POLICY

Policy of this class:

- If you need to miss a lecture for justifiable reasons (sickness, family obligations, etc.), you must inform the instructor in advance or immediately after the day of absence.
- Lecture attendance is mandatory. The instructor may report to the Registrar’s Office if
absence is excessive, which may result in an administrative drop from the class.

- Some exam questions directly reflect material and hints covered in the lecture.
- Auditing students are expected to attend lectures.

The following is the University policy on absence:

Students are expected to be regular and punctual in class attendance. The University believes that students themselves are primarily responsible for attendance. Instructors will provide students with written statements of their policies with respect to absences. Excessive or extended absence from class is sufficient reason for the instructor to recommend that the student be administratively dropped from the course. For those courses in which enrollment is limited, missing the first class session may be interpreted as excessive absence. If this action is filed in the Registrar’s Office by the end of the fourth week of classes, it will result in cancellation of registration in the course. If the student is administratively dropped after the end of the fourth week of classes, it will result in a failing grade being awarded in that course.

**ACADEMIC INTEGRITY**

Principle Integrity and ethical behavior are expected of every student in all academic work. This Academic Integrity principle stands for honesty in all class work, and ethical conduct in all labs and clinical assignments. This principle is furthered by the student Code of Conduct and disciplinary procedures established by ABOR Policies 5-308 through 5-404, all provisions of which apply to all University of Arizona students.

This Code of Academic Integrity (hereinafter "this Code") is intended to fulfill the requirement imposed by ABOR Policy 5-403.A.4 and otherwise to supplement the Student Code of Conduct as permitted by ABOR Policy 5-308.C.1.

Failure to follow the code of academic integrity will result in failing the course and being reported to the Dean of Students’ office.

**Prohibited Conduct:** Conduct prohibited by this Code consists of all forms of academic dishonesty, including, but not limited to:

1 Cheating, fabrication, facilitating academic dishonesty, and plagiarism as set out and defined in the Student Code of Conduct, ABOR Policy 5-308-E.6, E.10, and F.1
2 Submitting an item of academic work that has previously been submitted without fair citation of the original work or authorization by the faculty member supervising the work.
3 Violating required professional ethics rules contained or referenced in the student handbooks (hardcopy or online) of undergraduate or graduate programs, or professional colleges.
4 Violating health, safety or ethical requirements to gain any unfair advantage in lab(s) or clinical assignments.
5 Failing to observe rules of academic integrity established by a faculty member for a particular course.
6 Attempting to commit an act prohibited by this Code. Any attempt to commit an act prohibited by these rules shall be subject to sanctions to the same extent as completed acts.

**Mutual Expectations**

**Students:**

1. Take responsibility for your academic career. 2. Attend lectures and recitation sections regularly. 3. Complete your assignments on time. 4. Seek help when needed; make use of instructor's office hours and TA office hours. 5. Participate in class activities.

**Instructor:** 1. Be fair. 2. Be available and provide help when needed. 3. Ensure that students have the opportunity to demonstrate their achievement of the following course objectives:

Upon completion of this course, students should:

- Understand the definition of a fluid and how it is different from a solid
- Know the basic properties of fluids and how to use them in problem solving
- Understand the assumptions for ideal flow
- Understand the difference between laminar and turbulent flow and the transition between them, and know how to determine these flow regimes
- Be able to calculate hydrostatic pressures on a plates, weirs, gates and curved surfaces, and locate the center of pressure
- Understand the principles of pressure measurements and know about their applications
- Understand the continuity equation, Bernoulli’s equation and momentum equation and apply them in problem solving
- Understand major losses and minor losses, and know how to apply them in simple pipe flow analysis