

530.327 – Introduction to Fluid Mechanics Fall 2008

Lectures MWF 10-11, Hodson 213
Problem session TBA

Instructor Prof. Lester K. Su
Latrobe 229, lsu@jhu.edu, 6-8637

Office hours M 1-2, F 9-10, lunch Friday
also come by whenever my door's open

TAs Will Anderson, CSEB 319, 6-0435, w.anderson@jhu.edu
Office hours: M 3:30-4:30

Hann Wang, hann@jhu.edu
Office hours: T 1:30-2:30, in Latrobe 106

Web page <http://imaging.me.jhu.edu/courses327.html>

Text Fox, R.W., McDonald, A.T. and Pritchard, P.J., *Introduction to Fluid Mechanics*, 7th ed., Wiley (at the bookstore) (the 6th edition will almost certainly be OK too)

On reserve van Dyke, M., *An Album of Fluid Motion*, Parabolic (TA357 V35)

Grading	Homework (~10)	20%
	Quizzes (~10)	10%
	Midterms (2)	25%
	Labs (3)	20%
	Final	25%

(Your lowest quiz score will be dropped)

Goals In this course, you will acquire the fundamental mathematical tools and physical insight necessary to approach realistic fluid flow problems in engineering systems. Beyond problem solving, emphasis will be placed on developing physical intuition for fluid flows. Properly applied, this intuition can greatly ease the solution of fluid flow problems, for example by allowing the use of simplifying assumptions. Laboratory assignments provide physical examples to complement the analytical treatment in lectures and homework assignments.

I like to think of physical intuition this way. Suppose you're flying home or something, and the person next to you finds out you're a student, and asks "What's your major?" and you say "Engineering" and he/she asks "What kind of classes do you take" and you answer (of course) "Fluid mechanics and stuff" and he/she says "Really? So I've always wondered, what does that thing on the end of the wing do?" you should be able to reason your way to an answer.

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Problem session. There will be a weekly, one-hour problem session in which I, or one of the TAs, will go over one or more problems that are related to the current homework assignment. The timing of this session will be announced soon, based on people's schedules.

Office hours. Besides the office hours posted, any time my door is open you should feel free to stop in and ask questions. Also, on Fridays anyone is welcome to join my research group and me for lunch (meet in my office at noon – we go somewhere on or near campus).

Course text and lecture notes. The material covered in the course will be primarily drawn from the course text by Fox, McDonald and Pritchard. Occasionally I will choose either to cover material not included in the text, or to take a different approach to material that *is* covered in the text; in those instances I will usually distribute supplemental lecture notes. However, you are responsible for any material that I cover in class whether or not it's in the text or any printed notes.

Homework. Homework will always be due at 5 pm in my office on the given date, which will generally be on Tuesdays. I don't make homework due in class because I don't like people working on homework in class. So don't work on homework in class.

Any assignments (including labs) turned in late will be automatically subject to 50% deductions, unless prior permission has been requested and granted. Such permission will only be given if there is an unavoidable conflict. "I didn't realize it was due today" does not constitute an unavoidable conflict. No credit will be given for homework submitted after solutions have been posted on the website or distributed in class.

Quizzes. Closed-book quizzes will be given at the beginning of class, usually on Wednesdays, and will be very short, no more than 10 minutes. They will be easy, and for good reason – I (try to) design them so that anyone who completed that week's homework should have no difficulty.

Labs. There will be three laboratory assignments, which will be performed in small groups, though each of you will be responsible for submitting individual reports. We will go over lab scheduling, the format of lab reports, etc. later in the semester.

Exams. Exams will be open book, open notes. They will consist of some short answer questions to test intuition, and longer problems more reminiscent of the homework. My philosophy on exams is that I want them to rank accurately your understanding of the material. This requires that my grade distributions be wide and that the average scores be relatively low. I'm not actually trying to demoralize people with hard exams.

Grading. We will strive to make the grading as transparent, consistent and fair as possible. For all written work we will distribute solutions and point distributions that make clear why we deducted any points. If you ever suspect that we've made a mistake on the grading, you are encouraged to appeal to whichever of us graded that particular problem. In exchange for our extreme concern for grading fairness, we expect you to conform to high standards of personal integrity. Which brings us to the matter of academic ethics....

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Academic ethics. The following is our mandatory syllabus insert on ethics.

Cheating is wrong. Cheating hurts our community by undermining academic integrity, creating mistrust, and fostering unfair competition. The university will punish cheaters with failure on an assignment, failure in a course, permanent transcript notation, suspension, and/or expulsion. Offenses may be reported to medical, law or other professional or graduate schools when a cheater applies.

Violations can include cheating on exams, plagiarism, reuse of assignments without permission, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Ignorance of these rules is not an excuse.

On every exam, you will sign the following pledge: "I agree to complete this exam without unauthorized assistance from any person, materials or device. [Signed and dated]"

For more information, see the guide on "Academic Ethics for Undergraduates" and the Ethics Board web site (<http://ethics.jhu.edu>).

On a more personal note, I detest cheating in any endeavor with every fiber of my being. I personally grade one problem on each assignment, so I can get an idea of how you are all doing, but it will also be very obvious to me when people are cheating. You are encouraged to work together on assignments but what you submit must be your own work. I don't want to be put in the position of adjudicating any ethics incidents, so any time I suspect that cheating is taking place, I will first notify the Associate Dean of Students, Dorothy Sheppard (dsheppard@jhu.edu), that you are under suspicion, then we will adhere to the following procedure:

- If Dean Sheppard informs me that you have not previously been found guilty of an ethics violation at JHU (either by confessing, or in a hearing of the Undergraduate Academic Ethics Board), you have two options:
 1. You can confess to a violation, in which case you will be given the standard sanction, which is a zero on the assignment in question, plus a partial-grade deduction after the course grades are computed (e.g. A to A-, or B- to C+, etc.). I will also inform Dean Sheppard that you have confessed to a violation. She will file a report of the incident and there will be no further punishment.
 2. You can maintain your innocence and request that Dean Sheppard convene the Undergraduate Academic Ethics Board for a hearing on your case. This could result in your exoneration, or in a more severe punishment than the standard sanction above. Be aware that the Ethics Board can impose *any* punishment it chooses, including notations on your transcript, all the way up to expulsion from the University.
- If you have previously been found guilty of a violation in this class or any other, your case will automatically, by JHU policy, be referred to the Ethics Board.

I do want to make clear that I'm aware that the vast majority of students are honest, and the last thing I want to do is discourage students from working together. After all, working together on assignments is one of the most effective ways to learn, both through learning from and explaining things to others. The ethics rules are in place to ensure that the playing field is level for all students. The following examples will hopefully help explain the distinction between what constitutes acceptable cooperation and what's not allowable.

Student 1: Yo, I dunno how to do problem 2 on the homework, can you clue me in?

Student 2: Well, to be brief, I simply applied the **** principle that is thoroughly explained in Chapter **** in the course text.

Student 1: Dude, thanks! (Goes off to work on problem.)

- **This scenario describes an acceptable interaction. There's nothing wrong with pointing someone in the right direction.**

Student Y: The homework's due in fifteen minutes and I haven't done number 5 yet! Help me!

Student Z: Sure, but I don't have time to explain it to you, so here. Don't just copy it, though. (Hands over completed assignment.)

Student Y: I owe you one, man. (Goes off to copy number 5.)

- **This scenario is a textbook ethics violation on the part of both students. Student Y's offense is obvious; student Z is guilty by virtue of facilitating plagiarism, even though he/she is unaware of what student Y actually did.**

Joe Student: Geez, I'm so swamped, I can't possibly write up the lab report *and* do the lab data calculations before it's all due.

Jane student: Well, since we were lab partners and collected all the data together...maybe you could just use my Excel spreadsheet with the calculations, as long as you did the write-up yourself...

Joe Student: Yeah, that's a great idea!

- **That is *not* a great idea. By turning in a lab report with Jane's spreadsheet included, Joe is submitting something that isn't his own work.**

Study group member I: All right, since there's three of us and there's six problems on the homework, let's each do two. I'll do one and two and give you copies when I'm done.

Study group member II: Good idea, that'll save us a lot of work. I'll take three and five.

Study group member III: Then I guess I'll do four and six. Are you guys sure this is OK? Seems fishy to me.

Study group member I: What's the problem? It's not like we're copying the entire assignment. Two problems each is still a lot of work.

- **This is clearly wrong. Copying is copying even if it's only part of an assignment.**

Mike (just before class): Hey, can you help me? I lost my calculator, so I've got all the problems worked out but I couldn't get the numerical answers. What's the answer for problem 1?

Ike: Let's see (flips through assignment)... I got 2.16542.

Mike: (Writing) Two point one six five four two...what about number 2?

Ike: For that one... I got 16.0.

Mike: (Writing) Sixteen point oh...great, got it, thanks. Helping out a friend totally rules!

- **Helping out a friend this way does *not* rule, totally *or* partially. As minor as this offense seems, Mike is still submitting Ike's work as his own when Mike gets the numerical answer and copies it in this way.**