ME143 Introduction to Fluid Mechanics – Fall 2001
Course Syllabus

Professor: Darren L. Hitt, Ph.D.
Office: Votey 201-D, x61940
E-mail: Darren.Hitt@uvm.edu

Teaching Assistant: Kevin Rohyans
Office: Votey 121-A, x68323
Email: krohyans@zoo.uvm.edu

Office Hours: MW 3:30-5:30 pm (DH) TTh 10:00 am - 12pm (KR)
Lecture Hours: MWF 10:10-11:00 am, Votey 209
John Wiley & Sons, Inc.
Web Site: prometheus.emba.uvm.edu/me143
Prerequisites: ME12 (Dynamics), ME42 (Engineering Thermodynamics)

Course Overview
This course is intended as an introduction to the study of the mechanics of fluid motion. An outline of
the topics to be discussed is given below:

• Fundamental concepts, classifications, material properties and definitions of fluid mechanics
• Hydrostatics
• Equations of Fluid Motion - Integral Formulation
• Equations of Fluid Motion - Differential Equation Formulation
• Incompressible Inviscid Flow
• Dimensional Analysis and Scaling Principles
• Internal incompressible viscous flow (pipe flows)
• External incompressible viscous flow (boundary layers)
• Elements of compressible flow (time permitting)

About the Textbook
Fox & McDonald is regarded as one of the “classics” among introductory fluid mechanics texts. It is
written in such as way to teach the undergraduate how to perform a wide range of fluid mechanical
calculations and does this well; however, sometimes this comes at the expense of explaining the
associated “whys”. For this reason, the text will be occasionally be supplemented with additional
materials throughout the course of the semester.

Reading Assignments
As we proceed through the semester a regularly updated schedule will be posted on the course web
site indicating the current and imminent lecture topics. This schedule will also list the readings from
the text that correspond with the lecture material. It is best to regard the readings as unofficial
homework and it is strongly encouraged that you keep up with them to get the most out of lecture.

Exam Policy
There will be two midterm exams and one cumulative final exam, which will be given on the dates
shown below.
Midterm Exam #1  Fri., October 12  10:10-11:00 am
Midterm Exam #2  Mon., November 19  10:10-11:00 am
Comprehensive Final Exam  Thurs., December 13  8:00 - 11:00 am

Please note that the date and time of the final exam is set by the Fall 2001 Academic Calendar for the University. If you know in advance that you will be unable to attend a scheduled exam because of a previously scheduled activity or commitment you are responsible for notifying me at least one week in advance of the exam date (if possible). With prior notice other arrangements will be made for a make-up exam. Failure to give prior notification may forfeit your right to a make-up exam. In short, no make-up exams will be given except under extraordinary circumstances or without prior arrangement.

Group Design Project
A fluids design project will be assigned midway into the semester, and will be due at semester’s end. The project intent is to bring together concepts learned during the lecture and lab in the design and/or analysis of an fluids engineering device or structure. This will be a group-based activity with individual “Project Teams” consisting of 3-4 students. Students within each group will work in collaboration to produce a final design and write a group report. All students within a group will receive the same grade. The specific project, details and logistics for this semester will be announced towards the middle of the semester. At that time you will also be required to form your design groups, so you may want to start thinking about possible “colleagues” earlier in the semester.

Homework Policy
Homework assignments will, in general, be assigned weekly and will be due in class one week later. The homework will be reviewed for completeness and one problem will be selected for grading in detail.

- **COLLABORATION.** Collaboration on the homework is perfectly acceptable and strongly encouraged; however, each student is required to submit their own solution set which is to be written with their own explanations.

- **FORMAT.** Solution sets must be neatly written and documented, with pages securely fastened together (i.e., stapled or binder-clipped). Explanations of problem-solving approaches and key assumptions made should be provided. Penalties will be assessed for sloppy or poorly documented work.

- **DUE DATES.** At the time at which it is assigned, a deadline for the homework will also be given. An assignment is considered on time provided that it is in my mailbox or under my office door prior to my arrival (usually by 8:30 am) on the day following the due date.

- **LATE SUBMISSIONS.** Barring unusual circumstances, homework will not be accepted late. If you know in advance that you will be unable to hand in your homework on time because of a previously scheduled activity (e.g., varsity sports, off campus activity) you are responsible for notifying me prior to the due date. With prior notice I will give a reasonable homework extension; failure to give prior notification may forfeit your right to an extension.

Comprehension Quizzes
Throughout the semester you will be required to take occasional “comprehension quizzes” based on lecture material. The quizzes will generally be unannounced and may consist of a few short-answer questions and/or a simple calculation; allocated time for the quizzes will be on the order of 10 minutes. The primary intent is to provide periodic feedback on your progress and comprehension of the subject.
Course Web Site
A web site for this course will be maintained at the URL address http://www.emba.uvm.edu/me143/ and will serve primarily as a bulletin board, class archive and depository for supplementary materials (e.g., computer simulations and animations, video clips). A list of resources will be maintained which features suggested readings and reference texts as well as links to other relevant Internet sites. You are encouraged to check the web site on a regular basis to look for updated schedules, suggested reading assignments, and miscellaneous class announcements.

Grading Scheme
The relative weights of the exams, quizzes, homework and design project in determining the semester grade are as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Exams (2)</td>
<td>40%</td>
</tr>
<tr>
<td>Cumulative Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Group Design Project &amp; Report</td>
<td>15%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes*</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
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*The two lowest quiz scores will be dropped.

Final grades will be issued according to the traditional grading scheme: A-90%, B-80%, C-70%, and so on. I reserve the right to modify this scheme at my discretion, but any such modification will be in such a way as to lessen the requirements for a particular grade.

Attendance Policy
No formal attendance will be taken during lectures, however it is expected that students will attend class regularly. Supplementary materials and discussions not covered in the text will be an occasional feature of the lecture, so failure to attend will only compromise one’s learning experience.

Miscellaneous
There will be a few dates during the semester when I will likely be out of town on conference travel. Specific dates include:

- October 22-25
- November 13-15
- November 19

Unless otherwise stated, class will be held as usual on these days; lecture may be given by a substitute faculty or another supplementary activity scheduled.