CIVE 300 FLUID MECHANICS

COLORADO STATE UNIVERSITY
Fall 2014

Instructor: Dr. Timothy K. Gates, B209 Engineering, 491-5043, tkg@engr.colostate.edu
Office Hours: 11:30 – 12:30 Monday, 2:30 – 4 Wednesday, or by appointment

Grader: Corey Wallace, 970-412-3920, cdwallac@gmail.com
Office Hours: 9 – 10:30 Tuesday, 1 – 2:30 Thursday

Objectives: The objectives of this course are to develop for the students (1) an understanding of the fundamental physical principles governing the static and dynamic behavior of fluids, (2) analytical and mathematical skills needed to describe and predict fluid behavior, and (3) an ability to apply fundamental principles and skills to the engineering solution of some practical fluid systems problems.

Tentative Schedule:

Dates	Topics
25 August	Introduction to the Course
25 August – 8 September	Framework for Fluid Analysis; Fluid Properties
8 - 29 September	Fluid Pressure and Hydrostatics
29 September – 24 October	Conservation of Mass, Momentum, and Energy in Fluid Flow, *Midterm Exam I*
27 October – 7 November	Viscous Flow in Ducts and Conduits
7 – 21 November	*Midterm Exam II*; Flow Over Immersed Bodies
22 - 30 November	THANKSGIVING BREAK
1 December – 12 December	Open-Channel Flow
12 December	Course Review
18 December	*Final Exam* (7:30 – 9:30AM)

Text: Hibbeler, R. C. 2015. *Fluid Mechanics*. Pearson, Boston.

Homework: Typically, eight to twelve problems will be assigned each week. Usually, problems will be posted each Friday on the class website at http://www.engr.colostate.edu/CIVE300/course_info.html and will be due on the following Friday. Though *all problems must be turned in*, three problems out of each homework assignment will be indicated by the instructor as candidates for

grading and only one of those three will be thoroughly graded. Points will be deducted for problems that were assigned but not worked.

This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog (page 7) and the Student Conduct Code (http://tilt.colostate.edu/integrity/honorpledge/index.cfm). The **Honor Pledge** (attached) with a place for the student's signature must be applied to every exam and assignment (lecture and lab) turned in for this course. Please make sure that you read, understand, and comply with the **Policy on Academic Integrity in CIVE 300** statement on the class website. **Late homework will not be accepted**. It is recommended that you work other problems in addition to those assigned.

The instructor and grader will be available to answer your questions regarding homework during their office hours each week. Solutions to all assigned problems will be posted on the website after about a week. Reading assignments also will be made, for which students will be held responsible.

Exams: Two midterm exams will be given during the semester. The first is tentatively scheduled for sometime during the week of **6 October**, and the second for the week of **10 November**. The final exam will be comprehensive but at least 50% of the content of the final will cover material presented during the last part of the course. All exams will be closed book but each student will be allowed one side of one 8.5 x 11.0 inch sheet of paper containing his selected *hand-written* notes.

Grading: Homework – 15%; Midterm Exams – 25% each; Final Exam – 35%.

A:	90-100%
B:	80-89%
C:	70-79%
D:	60-69%
F:	<60%

Term grades for this course will use the +/- grading system as described in the CSU catalog.

Introduction to Instructor:

Born in Texas, I was raised with my younger brother and sister in Louisiana, where my mother still lives (you can probably detect the accent). I completed my BS degree at Louisiana Tech University in 1978 and my MS degree at Colorado State University in 1980. After working for several years, I attended the University of California at Davis where I completed my PhD degree. In 1988, I accepted a position on the Civil and Environmental Engineering faculty here at Colorado State University. I am associated with the Hydraulic Engineering and the Water Resources Planning & Management divisions of our department. Over the course of my career, I have had the opportunity to work on water projects in Egypt, Sri Lanka, India, and Australia and have lectured in China and in Vietnam.

I teach a variety of courses, primarily related to fluid mechanics and hydraulic engineering. My research focuses on field and computational analysis for description, design, and management of hydraulic and water resources systems. My specialty is in hydrosystems for irrigation and drainage, particularly open-channel and shallow groundwater systems. Much of my work has examined how to describe, simulate, and optimize such systems subject to various forms of uncertainty. I have some interesting research projects currently that address the characterization and improvement of flow, water quality, and water conservation in rivers, in shallow unconfined aquifers, and in irrigation systems.

My wife of 38 years, Valerie, and I are blessed with two sons, both now grown. Jeremy is a medical doctor serving as a surgeon with the U.S. Army, and is married to Robin. He is now serving in the Army hospital at Fort Benning in Georgia. Benjamin is a loan officer with Colorado Business Bank here in town, and is married to Katie. We are proud grandparents of Emmi (9 years), Cade (8 years), and Halle (4 years), children of Jeremy and Robin; and Everette (4 years), Penny (2 years), and Harvey (infant), children of Ben and Katie. Valerie is the consummate craftswoman: she loves quilting, needlepoint, cross-stitching, stenciling, interior decorating, and cooking. My sons participated in baseball, basketball, and soccer while they were at home. We also have enjoyed camping and skiing as a family. Reading, working in our yard, riding my bicycle, and spending time visiting with people are some of my favorite pastimes. I am looking forward to getting started on William Dembski's new book (to be released in September) *Being as Communion: A Metaphysics of Information* (http://www.beingascommunion.com/about/).

I am a Christian. I believe that nature is chock-full of countless examples of the Creator's intelligent design. I believe that Truth and Right exist in a real and objective sense, that they are found in Christ and should be pursued, and that they bring great blessing to those who embrace them. My convictions as a Christian form my world-view and guide the way I strive, under God's grace, to conduct my personal and professional life. Even though I enjoy my engineering and academic endeavors a great deal, I don't view them as the most important things (MITs) in life. I welcome the opportunity to chat with students outside of class about these MITs.

I look forward to getting to know you this semester, not only academically and professionally, but also personally. I take seriously my responsibility to help you learn fluid mechanics, a subject that I find to be richly fascinating and immensely practical. Please keep me informed of your concerns about the course.

T. K. Gates

CSU Student Honor Pledge

I pledge on my honor that I have not received or given any unauthorized assistance in this exam [assignment] [academic work].

Signature: _____

Date: _____