

CVEN 339 “WATER RESOURCES ENGINEERING”  
SUMMER SEMESTER (SESSION II) 2014

TEXAS A&M UNIVERSITY, ZACHRY DEPARTMENT OF CIVIL ENGINEERING

Instructor:

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Lectures: Mon/Tues/Thurs/Fri 12:00 – 1:55 PM; Room 118, Civil Engineering Building

Office Hours: To accommodate student schedules as much as possible, office hours will be set after students respond to the online poll at <http://doodle.com/9sq2r8f6speqknre>. This poll will close on Thursday, July 10<sup>th</sup>, at 11:00 AM.

Text: Wurbs, R.A., and W.P. James (2002). *Water Resources Engineering*, Prentice-Hall, Upper Saddle River, NJ. ISBN: 0-13-081293-5.

The text has been placed on reserve in the library.

Course Description: *From the TAMU Undergraduate Catalog:* “Quantitative hydrology, precipitation, hydrograph analysis, reservoir and stream routing; groundwater, Darcy equation, well equation, well design; probability concepts in design; water law; dams; reservoirs; spillways; open channel and pipe network hydraulics; pumps; urban stormwater drainage; flood damage mitigation. Prerequisite: CVEN 311.”

Welcome to Water Resources Engineering! This course is the gateway to solving many of the problems relating to water that civil engineers take on. These problems include flooding, droughts, water supply and distribution, fire protection, pollution control, and others. We’ll build on your knowledge of fluid mechanics with some new theory on the subject that will lead us into basic design issues. We’ll also begin studying “hydrology,” which is probably new to many of you as a formal study, but you’ve been exposed to it all your lives. I sincerely hope that you’ll see this course as the beginning of a lifelong interest in some of the most important problems that engineers face. Always let me know what I can do to help you learn the course material and to keep your interest.

Course Objectives: After completing this course students should be able to...

- (1) Use principles of conservation of mass, energy, and momentum to solve fluid mechanics problems;
- (2) Solve networks of pipes (pressure conduits) in various configurations and perform basic pipe network designs;
- (3) Articulate basic principles of the hydrologic cycle, watershed hydrology, and groundwater hydrology;
- (4) Predict watershed runoff from given rainfall using derived and synthetic unit hydrograph methods;

- (5) Route streamflows through river reaches and reservoirs using hydrologic methods;
- (6) Solve open channel hydraulics problems using concepts of normal, critical, gradually varied, and rapidly varied steady flows;
- (7) Perform basic channel designs;
- (8) Apply probabilistic analysis to aid in water resources design and management decisions;
- (9) Solve basic problems of groundwater flow and well design;
- (10) Discuss emerging and future problems in water resources engineering; and
- (11) Know the academic and professional steps available to pursue a career in water resources engineering after completion of this course.

<u>Grading:</u>	Class Participation	8%
	Homework	17%
	Exam 1	22%
	Exam 2	23%
	Final Exam (cumulative)	30%

Class participation credit can be earned in one of two ways. First, in lectures I will occasionally give a short (~5 min.) problem for students to solve given a few minutes to do so. Participation points can be earned by volunteering to come to the board and work the problem. Second, I will usually end lectures with a short discussion question. Before the next class, think about the question, do a little research on the web or at the library, and discuss it with classmates. Points can be earned by discussing your findings at the beginning of the next class.

There will be several Homework assignments throughout the semester. Homework assignments will be graded in two parts. About 50-80% (e.g., 5-8 out of 10 problems) of each assignment will be graded based on effort alone; you will receive full credit for simply making a reasonable attempt to solve the problem whether or not your answer is correct. You are free to work with others on those problems. The remainder of each assignment will be graded for accuracy of the solution. You *must* work these problems *individually*. Homework is due at the end of lecture on the announced date. Due to the shortened length of the summer semester, late homework will not be accepted.

Exams will be traditional written exams completed individually. A variety of formats including closed and open book, etc., may be used. Exact format of exams will be announced ahead of time. Absence from exams will be dealt with according to TAMU Student Rules (see <http://student-rules.tamu.edu/rules7.htm>).

Course Website: It's a good idea to check the course website at least daily for announcements. The website will also be the means by which homework assignments, solutions, handouts, etc., will be distributed.

[http://ceprofs.tamu.edu/kbrumbelow/CVEN339/CVEN339\\_WRE\\_Brumbelow.htm](http://ceprofs.tamu.edu/kbrumbelow/CVEN339/CVEN339_WRE_Brumbelow.htm)

**Semester Schedule:** Below is the tentative schedule for the course this semester. Modifications to this schedule may be announced in class at any time. Do *not* plan major life events (e.g., travel, childbirth, religious conversion, etc.) around this schedule before consulting with Dr. Brumbelow. Please note the reading assignments and complete them *before* the relevant lecture.

<b>Week</b>	<b>Dates</b>	<b>Topic and Reading Assignments</b>	<b>Homework/Exams</b>
0.75	Jul 8	Course Introduction <i>Chapter 1</i> Fluid mechanics review <i>Chapter 3.1-3.2, 3.4-3.8</i>	HW 1 Assigned
	Jul 10	Pressure conduits 1 <i>Chapter 4.1-4.4</i>	
	Jul 11	Pressure conduits 2 <i>Chapter 4.5, 4.7</i>	
1.75	Jul 14	Pressure conduits 3 <i>Chapter 4.5</i>	HW 1 Due HW 2 Assigned
	Jul 15	Pressure conduits 4	
	Jul 17	Introduction to hydrology <i>Chapter 2.1-2.11</i>	
	Jul 18	Modeling watershed hydrology 1 <i>Chapter 8.1-8.3</i>	
2.75	Jul 21	Modeling watershed hydrology 2 <i>Chapter 8.9</i>	HW 2 Due HW 3 Assigned
	Jul 22	<b>MIDTERM EXAM 1</b> (1 hour)	<b>MIDTERM EXAM 1</b>
	Jul 24	Modeling watershed hydrology 3 Hydrologic routing <i>Chapter 6.1</i>	
	Jul 25	Open channel hydraulics 1 <i>Chapter 5.1-5.6</i>	
3.75	Jul 28	Open channel hydraulics 2 <i>Chapter 5.7-5.8</i>	HW 3 Due HW 4 Assigned
	Jul 29	Open channel hydraulics 3 <i>Chapter 5.10</i>	
	Jul 31	Open channel hydraulics 4	
	Aug 1	Hydrologic frequency analysis 1 <i>Chapter 7.1-7.12</i>	
4.75	Aug 4	Hydrologic frequency analysis 2	HW 4 Due HW 5 Assigned
	Aug 5	<b>MIDTERM EXAM 2</b> (1 hour) Groundwater engineering 1 <i>Chapter 9.1-9.2</i>	<b>MIDTERM EXAM 2</b>
	Aug 7	Groundwater engineering 2 <i>Chapter 9.3</i>	
	Aug 8	Groundwater engineering 3 <i>Chapter 9.6 (omit 9.6.3-9.6.4)</i>	
5	Aug 11	Groundwater engineering 4	HW 5 Due
<b>Final Exam</b>		<b>Tuesday, Aug 12, 1:00 – 3:00 PM</b>	

Student Rules: TAMU Student Rules are posted at <http://student-rules.tamu.edu>. You should be familiar with these by now. Any issue not addressed explicitly in this syllabus will be governed by the Student Rules.

Absences: TAMU policies regarding student attendance/absences are defined in Part I, Section 7 of the TAMU Student Rules. In addition to those rules, the following policies will apply in this course:

- I do not check attendance as a part of regular course grading – no one will be penalized just for missing class. However, I reserve complete discretion to award bonus points for attendance. Absence or tardiness (even with an excuse) will disqualify a student for such bonus points. My decision on any such bonus points is final. Please do not argue with me over these points.
- I do not require an excuse for an absence on a day when no graded assignment was due or exam was given.
- To excuse an absence that falls under rule 7.1.6 (Injury or Illness that is too severe or contagious for the student to attend class), I will require a medical confirmation note completed by a healthcare provider with a contact phone number no matter how long the student is out of class.
- If a student knows ahead of time that they will be absent from class on a homework due date, they are allowed to have another person submit their assignment on the due date. This is encouraged but not required. A student can also turn in an assignment early.
- Attendance is required of all students for the term project presentations.

### **Official Notices**

ADA Statement: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>.

Academic Integrity Statement: “An Aggie does not lie, cheat, or steal or tolerate those who do.” Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. For additional information please visit:

<http://www.tamu.edu/aggiehonor/>

Students are expected to understand and abide by the Aggie Honor Code presented on the web at: <http://www.tamu.edu/aggiehonor> No form of scholastic misconduct will be tolerated. Academic misconduct includes cheating, fabrication, falsification, multiple submissions, plagiarism, complicity, etc. These are more fully defined in the above web site. Violations will be handled in accordance with the Aggie Honor System Process described on the web site.

The handouts used in this course are copyrighted. By “handouts,” I mean all materials generated for this class, which include but are not limited to syllabi, notes, quizzes, exams, in-class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts unless I expressly grant permission.

Violation of a student rule can result in disciplinary action including a grade penalty, up to and including an F in the course, suspension, dismissal, and expulsion from Texas A&M University. If you have any questions regarding plagiarism or other forms of scholastic dishonesty, please consult the latest issue of the Texas A&M University Student Rules, under the section 20 which can also be found at <http://student-rules.tamu.edu/>.