



CE323 Hydraulic Engineering and Design

Spring 2009

Catalog Description: (4 units) Open channel flow, natural streams and waterways, hydrologic analysis and design, pressure flow, analysis and design of pipe networks and pump systems.

Prerequisite(s): C E 218, Advanced Standing.

Course Objectives: To obtain the background theory and the basic design procedures for topics in hydraulics, hydrology and water resources engineering.

Instructor: Dr. Juan B. Valdés, PE
TA: Ms. Eleonora Demaria, MS
Class time & place: MF 9:00-9:50 @ Harvill 204; W 8:00-9:50 @ Harvill 204
Office Hours: WF 10:00-11:00 or by appointment, call 621-8787
Review Sessions: There will be a homework review session, Wednesdays **5-6pm location TBA**, the weeks when homework is due
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Tentative Outline

Week Starts	Topic	Reading	
1	1/12	Introduction. Pressure Flow Review.	4.1-4.3
2	1/19	Series and Parallel Pipe Flow. Branching Pipe Flow	4.5
3	1/26	Water Distribution Systems. Hydraulic Design of Culverts. <i>Project 1: HY8</i>	12.4, 12.6 16.2
4	2/2	Pumps: Introduction. Specific Speed. Net Positive Suction Head. Pump Characteristics.	12.2,12.5
5	2/9	Pump System Analysis. <i>Project 2: EPANET</i>	12.5
6	2/16	Introduction. Open Channel Flow	5.1
7	2/23	Specific Energy. Gradually Varied Flow. Test I.	5.2-5.3.1
8	3/2	Water Surface Profiles. Direct and Standard Step Methods. .	5.3-5.4
9	3/9	Water Surface Profiles. Direct and Standard Step Methods. Rapidly Varied Flow. <i>Project 3: HEC-RAS</i>	5.3-5.5
10	3/23	Spring Break	
11	3/30	Test II. Introduction to Hydrology. Precipitation. IDF Curves.	7.1-7.2
12	4/6	Rational Method. Unit Hydrographs. <i>Project 4: HEC-HMS .</i>	15.1-15.2 8.1-8.3
13	4/13	SCS Rainfall Runoff, Curve Number Method, SCS Synthetic Unit	8.6,8.7,8.8

		Hydrographs.	
14	4/20	Groundwater Flow: Introduction. Darcy's Law. Steady State Well Hydraulics.	6.1,6.3,6.4
15	4/21/08	Groundwater Flow: Unsteady Flow Well Hydraulics	6.5
16	4/27	Introduction to Bridge Scour	18
17	5/4	Bridge Scour. Course Review.	18

Final Exam: May 15 2009 8:00-10:00 Harvill 204

Evaluation

Homeworks & Class Participation (approximately 10)	15%
Design Projects (4)	15%
Tests (2)	40%
Final Exam	30%

Textbook:

"**Water Resources Engineering**", L. Mays, J. Wiley, 2005. (ISBN 0471297836). Errata for the past printings (before 2005 printing) of the book may be found at:

<http://www.public.asu.edu/~lwmays/wre.htm>

Class Attendance and Participation

No attendance will be taken. However if you decide to attend it is expected that you will **actively participate in the class**, e.g. arriving in time, no private conversations, no Wildcat reading, no working on homeworks, etc.

Homeworks and Projects

Homework assignments will be announced in class and will be due on the following Friday **at the start of class. No late assignments will be accepted, including assignments turned in during or at the end of the class.**

The projects may be done in groups of up to 4 students. You need to form your own group and notify me of its composition by the **end of the second week of classes**. Please use email to do this.

A written report is required for each project. It should be typed in a professional format (double spaced), and it should include your objectives, introduction, description of the system, a brief review of theory, some discussion of the design process, a description of the final design and alternatives, results and conclusions, and references. *A guideline for project reporting may be found in the D2L site.*

At the end of the semester you will need to provide a CD with all the documentation used in the projects.

Mid-term Exams and Final Exam:

There will be **two in-class, mid-term exams**. These exams will be closed book, but you will be allowed a cheat sheet. The size of the cheat sheet will be specified before each exam. Tests dates are approximate and will follow the termination of the topics assigned to the test.

Mid-term exams will be held at the end of the sections on Pressure Flow and Open Channel Flow on dates to be announced. The final exam will be held on **Friday May 15 8-10am**. It would also be closed book but you will be allowed a cheat sheet. The size of the cheat sheet will be specified before the exam.

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 be 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.

Student Responsibility

Students engaging in academic dishonesty diminish their education and bring discredit to the academic community. Students shall not violate the Code of Academic Integrity and shall avoid situations likely to compromise academic integrity. Students shall observe the generally applicable provisions of this Code whether or not faculty members establish special rules of academic integrity for particular classes. Students are not excused from complying with this Code because of faculty members' failure to prevent cheating.