

CME311 Water Resources Engineering

- Instructor:** Professor S. Derrible, 2071 ERF, derrible@uic.edu
Office hours: Monday: 2:00 – 3:00; Wednesday: 11:00 – 12:00
- TA:** I. Godinez, 1070 SEL, igodin1@uic.edu, 312-413-7638 (if door locked)
Office hours: Wednesday: 2:00 – 3:00; Friday 12:00 – 1:00
- Hours:** Lectures: Monday, Wednesday, Friday: 1:00 – 1:50
Labs: Thursday: 10:30 – 12:30; 1:00 – 3:00; 3:15 – 5:30
- Summary:** This course exposes students to concepts and practices of water resources engineering. It reviews fundamentals of hydrology, fluid mechanics, hydraulics of pipelines and pipe networks, open channels, groundwater engineering, and hydrologic frequency analysis.
- Pre-requisites:** CME211 Fluid Mechanics and Hydraulics
- Textbook:** Wurbs, A., & W. P. James, 2002, Water Resources Engineering, Prentice Hall, New Jersey
- Blackboard:** All published material “should” be posted on blackboard, including syllabus, lecture materials, problem sets, and lab instructions. Solutions to the mid-term exams will not be published. Any document placed on blackboard can be modified/deleted at any time without notification from the instructor.
- Objectives:** This course aims to provide students with the means to understand real world water resources engineering problems and apply their fundamental knowledge. More specifically, at the end of this course, students should be able to:
1. Put into their own words the hydrologic cycle,
 2. Discuss and recall any concepts of fluid mechanics within the scope of this course,
 3. Design and analyze pipe flow networks,
 4. Design and analyze open channels,
 5. Deduce groundwater engineering processes and main characteristics.
 6. Apply statistical analysis to account for hydrologic phenomena,
- Grading Policy:** Attendance, participation, behavior (10%)
Homework (10%) – best 5 out of 6
Labs (10%) – best 7 out of 8

Quizzes (10%) – best 4 out of 5
 Two mid-term exams (12.5% each)
 Final exam (35%)

The grading policy can be changed at any moment during the term.

Homework submitted late may receive a penalty; homework submitted after the answers have been posted will be given a 0 grade. All homework must be submitted or the students will be assigned a 0 grade for all of their homework.

While I understand it is easier to learn by collaborating, submissions must be individual unless explicitly mentioned.

Plagiarism: Plagiarism is a serious offense and it will not be tolerated; see university policy.

Attendance Policy: All students are required to attend both the lectures and the labs and be on time. If at any moment a student is to be absent, he/she should have discussed it prior with the instructor.

Professional Conduct: Whether during lectures or labs, the students are always expected to conduct themselves with the utmost respect towards the instructors and their fellow students. Cellphones are to be turned off.

Safety: Any unsafe conduct, especially during labs, will not be tolerated and may lead to expulsion.

Class Schedule (in progress):

Class	Date	Topic	Reading
1	Aug 27	Presentation	
2	Aug 29	Introduction	Chap 1
3	Aug 31	Water Properties and Hydroclimatology	Chap 2.1-2.2
4	Sep 3	No Class (Labor Day)	
5	Sep 5	Atmospheric Processes and Precipitation	Chap 2.3-2.4
6	Sep 7	Precipitation	Chap 2.4
7	Sep 10	Evapotranspiration and Units of Measures	Chap 2.5-2.6
8	Sep 12	Watershed Hydrology Subsurface water	Chap 2.7-2.11
9	Sep 14	No Class	
10	Sep 17	Mechanical Properties of Water	Chap 3.1-3.2
11	Sep 19	Statics	Chap 3.3
12	Sep 21	Statics	Chap 3.3
13	Sep 24	Correction of homework 1	
14	Sep 26	Statics (examples)	

15	Sep 28	Classification and Reynolds Theorem	Chap 3.4-3.5
16	Oct 1	Conservation laws and Dimensional Analysis	Chap 3.6-3.7
17	Oct 3	Hydraulics of Pipelines – Basic Equations	Chap 4.1.1-1.2
18	Oct 5	Basic Equations and Headloss	Chap 4.1.2-1.3
19	Oct 8	Headloss	Chap 4.1.3
20	Oct 10	Midterm 1	
21	Oct 12	Pumps in pipelines	Chap 4.2-4.3
22	Oct 15	Homework 2 solutions	
23	Oct 17	Learning KYPIPE	
24	Oct 19	Midterm 1 solutions	
25	Oct 22	Pipes in Series	Chap 4.4.1
26	Oct 24	Pipes in Parallel	Chap 4.4.2
27	Oct 26	Summary of chapter	
28	Oct 29	Open Channel – Manning Equation	Chap 5.1-5.3
29	Oct 31	Compound Channel and Critical Flow	Chap 5.3-5.4
30	Nov 2	Critical Flow	Chap 5.4
31	Nov 5	Critical Flow - explained	Chap 5.4
32	Nov 7	Channel Design	Chap 5.6
33	Nov 9	Quiz 4	
34	Nov 12	No class	
35	Nov 14	Gradually Varied Steady Flow	Chap 5.7
36	Nov 16	Rapidly Varied Steady Flow	Chap 5.8
37	Nov 19	Groundwater Engineering	Chap 9.1
38	Nov 21	Midterm 2	
39	Nov 23	No class (Thanksgiving)	
40	Nov 26	Darcy's Law	Chap 9.2.1
41	Nov 28	Wells	Chap 9.3.1
42	Nov 30	Random Variables and Probability	Chap 7.1-7.3
43	Dec 3	Empirical Relations, Probability Distributions	Chap 7.4-7.5
44	Dec 5	Quiz 5 and revision	
45	Dec 7	Revision	

Lab Schedule (in progress):

Lab	Date	Topic
0	09/13/2012	Hydrology Summary and Problem Solving
1	09/20/2012	Flow Measurements
2	10/04/2012	Manning Equation
3	10/11/2012	Pipe friction
4	10/18/2012	Pipe minor losses
5	10/25/2012	Pumps
6	11/01/2012	Take Up Storage and Release of Rainwater
7	11/15/2012	Groundwater Level on an Island
8	11/29/2012	Turbines