

**CE 371 - WATER AND WASTEWATER TREATMENT****SCOPE AND OBJECTIVES OF COURSE**

This course will provide an introduction to two general fields that have historically been a part of the Civil Engineering profession; water supply engineering and wastewater engineering. The field of water supply engineering includes the analysis and design of (1) water collection/transmission systems, (2) water treatment systems, and (3) water distribution systems. The field of wastewater engineering involves the analysis and design of (1) wastewater and storm water collection systems, (2) wastewater treatment systems, and (3) wastewater disposal systems. The objectives of this course are to provide the undergraduate civil engineering student with an overview of water supply/wastewater engineering and to provide a foundation for additional undergraduate/graduate study in Environmental Engineering.

**COURSE REQUIREMENTS**

<u>Examinations and Quizzes:</u>	There will be two mid-term examinations and one final <u>comprehensive</u> examination. In addition, there will be a design optimization project using a pipe network simulation.
<u>Problem Sets:</u>	Problem sets will be assigned during the semester as an aid in exam preparation. Homework will be graded, and the solutions posted on the internet.
<u>Determination of Final Grade:</u>	Exam 1- 25% Exam 2- 25% Final Exam- 30% Homework- 10% Computer Project- 10%
<u>Instructor:</u>	Dr. Bruce Logan, Sackett Building Rm. 231Q Office Hours: Monday-Thursday 1-2 pm
<u>Teaching Assistant:</u>	Husen "John" Zhang, Sackett Basement, Room 5C (Middle set of offices) Env. Engineering Graduate student room Office/HW help hours: Monday, 11-12; Wednesday, 1-3 pm.
<u>Text:</u>	Viessman and Hammer, Water Supply and Pollution Control, Sixth Edition.
<u>Meeting Times:</u>	11:15 - 12:30, Tuesday and Thursday, Sackett Building Rm. 128
<u>Exam Policy:</u>	There are no makeup exams. Your final exam grade will be used for a missed exam.

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**COURSE OUTLINE: CE 371 SPRING 2002**

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<b>CLASS</b>	<b>DATE</b>	<b>1. COMMUNITY PLANNING, WATER STORAGE</b>	<b>TEXT</b>
1a	Jan 8	Introduction; water use and reuse.	Ch1, Ch2, 4.1-4.4
1b	Jan 10	Water and wastewater flows; peak use estimation; Population forecasting	4.2-5, 4.7-10
2a	Jan 15	Hydrologic cycle; water storage	3.1-12, 3.15
2b	Jan 17	Groundwater, well sizing	3.16-21, 25, 26
<b>2. WATER DISTRIBUTION SYSTEMS</b>			
3a	Jan 22	Review of hydraulics; pressurized pipe analysis	5.1-3
3b	Jan 24	Equivalent pipes/loops; Hardy-Cross method.	5.3-6; 5.7 (140-148);
4a	Jan 29	Computer simulation networks; pump curves	5.7 (140-148); 5.9-14
4b	Jan 31	Computer project on water distribution analysis.	
<b>3. WASTEWATER COLLECTION SYSTEMS</b>			
5a	Feb 5	Gravity pipe analysis; wastewater collection	6.1-11
5b	Feb 7	Storm water collection, design, maintenance	6.12-18 (219-236)
6a	Feb 12	Runoff calculations	6.12-18 (219-236), 6.19
6b	Feb 14	***** <b>EXAM 1</b> ***** (Classes 1a through 5a)	
<b>4. WATER TREATMENT</b>			
7a	Feb 19	Drinking water standards	7.1-8, 7.10
7b	Feb 21	Chemical measurements; mass balances	notes
8a	Feb 26	Drinking water treatment processes- Overview, flocculation	9.6-9, 10.9-10
8b	Feb 28	Sedimentation	10.11-14
	Mar 5&7	<i>Spring Break</i>	
9a	Mar 11	Filtration	10.18-23
9b	Mar 14	Chemistry review, water softening	11.1-10
10a	Mar 19	Water softening, water disinfection	11.11-17, 1.18-25
<b>5. WASTEWATER TREATMENT</b>			
10b	Mar 21	Wastewater pollutants, Biochemical oxygen demand (BOD)	7.8-10
11a	Mar 26	BOD rates, Primary wastewater treatment (WWT), overview of secondary WWT	9.1-5, 10.1-5, 10.16-18
11b	Mar 28	***** <b>EXAM 2</b> ***** (Classes 6a-10b)	
12a	Apr 2	Microbiology, microbial kinetic theory, batch and CSTR reactors	10.6-8, 12.1-9
12b	Apr 4	Plug flow reactors	10.6-8
13a	Apr 9	Activated Sludge reactors: suspended growth reactors with recycle;	12.19-25
13b	Apr 11	Activated Sludge reactors:	12.19-25
14a	Apr 16	Trickling filters- theory	12.12-18
14b	Apr 18	Trickling filters- examples	12.12-18
15a	Apr 23	Other wastewater treatment systems (lagoons, septic tanks)	12.27-33
15b	Apr 25	Sludge handling, septic tanks	13.6-9, 13.13-16
<b>Final Exam (during finals week) 50% weeks 1-10, 50% 11-15</b>			

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