

CE 421 ENVIRONMENTAL ENGINEERING

Required Course
Fall 2008

Instructor: Atilla Akkoyunlu
Office Hours: Th&F: 10:00 – 12:00

Course Data: Hours: MMTT 3412 Room: 2170, 2170, 2180,2180

Course Description (Catalogue):

CE 421 Environmental Engineering

(3+ 0+ 0): 3

Water supply sources, transmission, water distribution reservoirs and networks; wastewater collection and disposal; introduction to water and wastewater treatment methods.

Course Objectives (Learning Outcomes) : This course is designed for seniors in civil engineering to make them familiar with water supply sources, collection systems, transmission, distribution and then collection of wastewater and disposal of them.

Textbook:

•Fair, G.M., Geyer, J.C., “*Elements of Water Supply and Wastewater disposal*”, John Wiley and Sons Inc., 1964. *TD145.F29*.

Ref. Books:

Fair, G.M., Geyer, J.C., and Okun, D.A., “*Elements of Water Supply and Wastewater Disposal*”, John Wiley and Sons Inc., 1971. *TD145.F29*.

Peavy, H.S., Rowe, D.R., Tchobanoglous, G., “*Environmental Engineering*”, Mc Graw - Hill Book Co., 1985, *TD 145. P43*.

Pandey, G.N., Carney, G.L., “*Environmental Engineering*”, Tata McGraw - Hill, 1989. *TD145. P36*.

Circular Context: Fluid Mechanics and Hydraulic Engineering I courses are prerequisites for this course. Prepares the CE students for their involvement in the projects of municipal infrastructure systems.

Laboratory and Computer Usage: Students write computer programs in water transmission and distribution, and collection of wastewater for homeworks. Laboratory Sessions are N/A.

Class policies:

Attendance: 5%

Quizzes + Midterms + Homeworks + Final: Grading Percentages determined after the results are obtained.

Contribution of the course to program outcomes:

- (a) An ability to apply knowledge of mathematics, science and engineering.
- (d) An ability to function on multi disciplinary teams.
- (e) An ability to identify, formulate and solve engineering problems.
- (f) An understanding of professional and ethical responsibility.
- (h) The broad education necessary to understand the impact of engineering solutions in a global and social context.
- (k) An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Course Assessment:

Course will be assessed on the basis of the accomplishments regarding the course objectives and contributions to the program outcomes. The evaluation will consist mainly of the responses from students who will provide their comments to various course related questions in the final week of the semester.

Week	Topics	Reading Assignments	Objectives
1	General introduction to Environmental Engineering	-	Introduction to Environmental Engineering
2	Water works systems; introduction to watersheds, their protection. QUIZ 1	Chap.1; Chap.2, Sect.2.8	Introducing alternative water works systems; information about watershed protection
3	Groundwater flow. Pollutants in a ground water sample	Chap.5, Sect.5.1-5.4.	Presenting Darcy law. Pollutants in ground water
4	Collection of ground water by springs; water collection chamber design	Chap.5, Sect.5.18	Design of a water collection chamber
5	Collection of groundwater by drain pipes	Chap.5, Sect.5.5.	Design of drain pipes when ground water table is horizontal and has a sloped surface.
6	Collection of ground water by wells; unconfined and confined steady flow into wells. QUIZ 2	Chap.5, Sect.5.6 – 5.8, 5.12- 5.17, Sect. 5.11	Introduction to ground water flow into wells.
7	Water transmission by pressure conduits from source to water distribution reservoir. MIDTERM 1	Chap.6	Design of pressure conduit water transmission lines, required appurtenances along the line.
8	Design of water distribution reservoir.	Chap.7, Sect.7.6-7.7	Design of buried and elevated reservoirs, and their operational aspects.
9	Design of potable water distribution network	Chap.7, Sect7.1-7.5	Water distribution network design by stagnation point (dead end) method.
10	Composition of domestic wastewater and its characteristics. QUIZ 3	Chap.11	Component of wastewater. Physical, chemical and biological characteristics of wastewater.
11	Collection of wastewater by sewer lines	Chap.8, Chap.9	Introduction to domestic wastewater sewer line design.
12	Collection of storm water. MIDTERM 2	Chap.10	Introduction to storm water sewer line design.
13	Potable water treatment. Wastewater treatment. QUIZ 4	Chap 12	Introduction to water purification and wastewater treatment.