



**UNIVERSITY OF TEXAS AT ARLINGTON
COLLEGE OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING**
Arlington, Texas 76019

**CE 4328 – Water Systems Design
COURSE SYLLABUS
Spring 2012**

Section:

001, 11:00-12:20 Tuesday, Thursday

Woolf Hall, Room 210

Instructor:

Dr. John A. McEnery, P.E.

Office:

405 Nedderman Hall

Phone:

817-272-0234

E-Mail:

mcenery@uta.edu

Office Hours:

2:30 - 3:30 pm T & R;

Office Appointments:

The office hours listed above are available for the instructor to assist students, and students are **VERY** encouraged to use them. Other times may be possible by appointment if arranged in advance. However, Mondays, Wednesdays and Fridays are typically reserved for research.

GTA: Roger Wheeler 265 ELB roger.wheeler@mavs.uta.edu 817-272-0718

GTA Hours: TBD

2008-2009 Catalog Description:

CE 4328: Water Systems Design (3:3:0). Hydraulic analysis and design of municipal water distribution, stormwater collection, and wastewater collection systems.

Prerequisite: CE 3305, 3309

Textbook:

Water Supply and Pollution Control, Viessman and Hammer, 8th Ed., 2008.

Modern Sewer Design American Iron and Steel Institute, 4th Edition, 1999.
(<http://www.ncspa.org/pdf/bluebook.pdf>).

Course Purpose:

The purpose of this required junior level design course is to introduce students to the process of applying basic engineering fundamentals to the development of solutions to municipal water problems and to the documentation of analysis, design and recommendations in formal engineering reports.

Course Objectives:

To develop within the student the abilities to:

1. Understand the engineer's professional responsibility in the design process
2. Identify, formulate and solve problems found in municipal water systems design
3. Integrate codes, standards and appropriate Federal, state and local regulatory requirements into the design process

Topics:

1. Water system components
2. Hydraulic principles
3. Stormwater management system components
4. Stormwater collection system design
5. Permits and Best Management Principles (BMPs)
6. Population and demand forecasting
7. Distribution system analysis methods and design techniques
8. Pumps and pump selection
9. Fire demands
10. Storage requirements and alternatives
11. Sewage collection system components
12. TNRCC/TECQ design criteria
13. Hydraulic design of sewage collection systems
14. Loads on buried pipes

Class/Laboratory Schedule:

Class meets fifteen weeks, two times per week for 80 minutes

Evaluation Process:

1. Students are evaluated on their understanding of the design process as applied in municipal water systems.
2. Three exams of one and one-half hour duration over concepts and design applications
3. Two team projects:
4. Comprehensive final exam of two and one-half hours duration.

Grading Policy:

90-100%	A
80-89%	B
70-79%	C
60-69%	D
60%>	F

Course Grade Structure

Homework/Quizzes	14%
Exams (2)	33%
Projects (2)	33%
Final Exam	20%

The instructor reserves the right to adjust the grade distribution. Any concerns about scores on individual assignments, tests or projects must be brought to the attention of the instructor within 7 days from the day that the score was returned to the student. After 7 days, scores are closed to discussion.

Contribution of Course to Professional Component of the Curriculum:

This required junior level course addresses critical knowledge and design practice required for civil engineering practice. It fits in the sequence of fluid mechanics, hydrology, hydraulic design elective and/or capstone design course. At the end of the sequence, students are familiar with water distribution and wastewater/stormwater collection system components and are prepared to utilize a combination of basic engineering principles, analytical techniques, design criteria and

regulatory requirements in the solution of problems associated with these basic but critical elements of our infrastructure.

Relationship to Program Objectives:

This course is designed and conducted to provide students with an opportunity to apply knowledge, tools and skills necessary for them to become successful engineers and lifelong learners. Through the use of realistic projects, the students develop recommendations for implementation based on a thorough technical and economic evaluation of the engineering alternatives deemed feasible. They are encouraged to devote sufficient time and effort in the preparation of quality reports, since the reports are the instruments that convey the engineering information to the client who will use them as tools in decision-making. Content of this course will also provide the student with useful preparation for the Fundamentals of Engineering exam.

Design Component:

The Civil Engineering Department ABET procedure includes assessing the achievement of various departmental student learning outcomes (<http://www.uta.edu/ce/accreditation.php>). CE 4328 is designated as a "Design" course for the CE Department, through which the following outcomes will be assessed:

CE Department Outcome "c": An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

ABET Program Outcome: An ability to design a system, component or process in more than one civil engineering context.

The following process will be followed in this course towards assessing the outcomes:

1. There will be a design term project, including both analysis and synthesis requiring at least three weeks of effort.
2. The project must have some iterative components. Students will be encouraged to define the design problem, including scope and design objectives.
3. The course project will be open-ended, with at least a few alternate solutions.
4. The course project or assignment should include any applicable codes and regulations, and also a minimum of two realistic design constraints from the following list: economic, environmental, social, political, ethical, health and safety, constructability, and sustainability.
5. A design summary report must be completed by students at the semester end; it should include a documented analysis of alternatives and consideration of constraints.
6. The minimum passing grade in the project is 70.
7. The project grade will also count towards your overall course grade, as discussed later.

Specific Outcomes of Instruction – these are learning goals that students are expected to attain related to specific topics.

-Students will demonstrate the ability to design components of engineered systems and processes used in water system design.

Student Outcomes –

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

Meeting Policy:

In the event that the instructor is delayed, the class shall wait 10 minutes before dismissing. Course assignments and material for which the student is responsible on the missed class session will be considered due at the start of the next scheduled meeting.

Attendance:

Attendance for all class sessions is expected, although it will only be recorded for the first few weeks of the semester as a check of the roster. For the majority of the semester attendance will not be taken. However, I hope that the discussion in class will be of sufficient benefit that class attendance will be directly correlated to test performance. Quizzes covering current material may be given throughout the course. Quizzes will not be announced in advance. Missed quizzes and missed homeworks will count as zero.

Homework:

Homework assignments will be given throughout the semester, and will generally be due one week after they are assigned. The completion of these assignments is an essential means of preparing the student for examinations, and homework effort is directly reflected in test performance.

Throughout the semester homework assignments will be graded. However, only one random problem from each homework set will be collected for grading. Therefore, prepare all separate problems in each homework set on individual paper, so that upon request, individuals problems can be submitted for scoring. Begin each problem on a separate sheet of paper! Homework scores will be included with quiz scores. Missed homework can not be made up. Late homework will not be accepted. All assignments that are submitted for review or collected for grading must be completed on standard engineering paper, or printed on computer paper. One purpose of this course is to give the student experience in preparing professional papers. Therefore, the appearance of the work will be taken into consideration for grading. Always draw a box around your final answers and clearly indicate the units for the answer. If you draw plots, remember to use good engineering practice, ie; label data points and axis, provide title and legend. Illegible work will not be graded!

Semester Project Reports:

This course will include work in the form of 2 semester projects. Details of the projects will be provided later in the semester.

Exam Policy:

If you must miss an examination due to circumstances outside of your control, a makeup may possibly be arranged at the discretion of the instructor (only if you act promptly). Notify the instructor in advance when possible. No unexcused make-up exams will be given. If you miss an exam, you will receive a zero unless you made arrangement in advance with the instructor or you can demonstrate an emergency existed that you could not circumvent.

The exams and final will not be offered at any times other than that regularly scheduled. Exceptions may be allowed at the instructor's discretion, if accompanied by a medical report from a real doctor. For consideration of other absences, notify the instructor in advance.

Exams are closed book. Students will be provided a handout of helpful conversion factors which they may use for each exam. Students may not bring any other material to the test except for pencils, straight-edge, erasers, and calculators. See calculator and electronics policy below.

Calculators:

Only NCEES approved calculators will be permitted during tests and your test will be collected and your grade will be a zero if you are caught using a non-approved calculator. The approved calculators include the following:

- Hewlett Packard – HP 30s, HP 33s, HP 9s
- Casio – FX 115 ES, FX 115 MS, and FX 115 MS Plus (Note: FX 115 ES and FX 115 MS models ending with an "-SR" designation are also allowed.)
- Texas Instruments – TI 30XA (or TI 30Xa), TI 30X IIS and TI 30X IIB, TI 36X Solar
- If you are unsure about your calculator, it is your responsibility to check with the instructor for approval.

Laptops/PDAs/MP3 Players/Cell Phones/ etc.:

The use of any electronic device, except an approved calculator, is not permitted during exams. Your exam will be collected and your grade will be a zero if you are caught using a non-approved electronic device. The use of phones, MP3 players and recorders is not permitted during lessons. **Cell phones must be turned off and stowed away when in the class room.** Electronic recording devices (including cell phone cameras) are not allowed in class, without explicit permission by the instructor in advance. Violation of this policy will be ground for academic dishonesty.

Recommended Stuff:

Calculator
Diskettes or Computer memory device/drive
Engineering paper
Pencils and eraser
Coffee

Students are also expected to have with them a calculator and sufficient drawing tools (scale, triangle, etc.) to complete in-class assignments.

Food & Drink:

Coffee and lots of it... Just take your trash with you.

Americans with Disabilities Act: If you require an accommodation based on disability, I would like to meet with you in privacy of my office during the first week of the semester to be sure you are appropriately accommodated. To be able to qualify for assistance under this act, you will need a letter from the UTA office of Counseling and Career Development.

Student Support Services Available:

The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.

Final Review Week: "A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabi. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any

portion of the final examination during Final Review Week.” (The University of Texas at Arlington, Undergraduate Catalog 2007-2009, Academic Regulations.)

Academic Dishonesty: Each student is expected to do their own work. Collaboration and discussion with classmates is expected. However, copying or other blatant use of another's talents instead of your own is unacceptable and will seriously impact your course grade at the discretion of the instructor. All students are expected to pursue their academic careers with honesty and integrity. Academic dishonesty includes, but is not limited to, cheating on a test or other course work, plagiarism (offering the work of another as one's own) and unauthorized collaboration with another person. All exams and projects will be retained by the instructor. Removal of an exam or the duplication of exam or project content in any form will be considered academic dishonesty. Students found responsible for dishonesty in their academic pursuits are subject to penalties that may range from disciplinary probation to suspension to expulsion from the University.

In accordance with the Rules and Regulations of the Board of Regents of The University of Texas System (Part One, Chapter VI), institutional procedures regarding allegations of academic dishonesty are outlined in Part Two, Chapter 2, of the U.T. Arlington Handbook of Operating Procedures. This information may be obtained by accessing the Student Judicial Affairs Web site at www2.uta.edu/discipline/ or by obtaining a hard copy of Mav Dates & Data in the Office of Student Development. (The University of Texas at Arlington, Undergraduate Catalog 2005-2007, Academic Regulations.)

UTA Communication Policy: “E-mail is the prime means for communication. Therefore, the University has the right to send communications to students via e-mail and the right to expect that those communications will be received and read in a timely fashion. The Office of Information Technology (OIT) will assign all students an official University e-mail address. It is to this official address that the University will send e-mail communications. Students are expected to check their official e-mail account on a frequent and consistent basis to stay current with University communications. The University recommends checking e-mail daily; in recognition that certain communications may be time-critical. .” (The University of Texas at Arlington, Undergraduate Catalog 2007-2009, Academic Regulations.)

FTP (MavSpace) Site: Handouts, notes, problems solutions and other information are located at the MavSpace course site. The address for that site will be given during class.