Syllabus

Course Location, Textbook, Instructor Contact Information

Class Meetings:	18:30-19:50 , T-TH, CE 001 (Section 001) 11:00-12:20 , T-TH, CE 211 (Section 002)
Instructor:	Theodore G. Cleveland, CE Room 203F
TA:	none
Office Hours:	Open Door Policy
Telephone:	(806)834-5101
E-mail:	`theodore.cleveland@ttu.edu`
Web:	`http://atomickitty.ddns.net/`
Textbook(s) :	materials on server; representative list at end of document.
Copyright :	

Catalog Description

> **3372. Water Systems Design (3:3:0).** Prerequesite: CE 3305[1], 3354[2]. Hydraulic analysis and design of municipal water distribution, stormwater collection, and wastewater collection systems. Oral and written presentations. (Writing Intensive)

Course Objectives

The purpose of this class is to study the theory and application of hydraulics, learn how to use predictive tools such as charts and computer programs, and apply these tools to the analysis and design of distribution and collection and pumping systems. Preparation of professional reports is an equally emphasized objective of this course.

Knowledge, Skills, Abilities (KSA)

During this course the student will

1. Read, synthesize, and communicate ideas presented in current and historical technical literature.
2. Perform flow and transport computation in simplistic topologies using Excel, or **R** as needed[3].

[1] Mechanics of Fluids

[2] Engineering Hydrology

[3] This task is principally to develop understanding of how the professional tools function. Excel and **R** are professional tool in their own right, but the skill level to use them for engineering is beyond the scope of this class.

3. Perform flow and transport computation in realistic geometries using EPA-NET or similar professional tools for water distribution systems.
4. Perform flow and transport computation in realistic geometries using SWMM 5.0 or similar professional tools for stormwater and wastewater collection systems.
5. Size and select engineering materials (pipes, pumps, valves, etc.) for use in the drinking water environment (water distribution), the stormwater environment, and the wastewater environment.
6. Prepare professional reports for the design of a drinking water distribution system, a stormwater collection system, and a wastewater collection system.

ABET Program Outcomes

A subset of the ABET Program Outcomes are addressed in CE 3372, these outcomes are listed below:[4]

- `3[a].` Ability to apply knowledge of mathematics, science, and engineering.
- `3[b].` Ability to design and conduct experiments, as well as to analyze and interpret data.
- `3[e].` Ability to identify, formulate, and solve engineering problems.
- `3[i].` Recognition of need for life-long learning.
- `3[k].` Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- `8[d].` Proficiency in water resources engineering.

Course Specific Policies

Any policies stated in this section that differ from University Operating Policies are null and void and the University Operating Policies shall be in force.

Disability:

Texas Tech policy provided as part of syllabus (see last section).

Religious Holidays:

"A student who intends to observe a religious holy day (as defined by OP 34.19) should make that intention known to the instructor prior to the absence in order to receive accommodations prescribed by OP 34.19."

[4] Item 3[b] below is only partially fulfilled — in this course students will analyze and interpret data, design of experiments is beyond the scope of the class.

Cellphones/Pagers:

Please set your personal communication devices to silent ring or off during class. Do not take calls in class. Disturbance during class time is not acceptable.

Prerequisites:

Mastery of material from CE 3305 and CE 3354 or equivalent is expected.

Attendance:

Roll will be taken to determine attendance for class participation. Please let the instructor know in advance if you must miss a class for a legitimate reason[5].

Evaluation Instruments and Grading

Student performance will be evaluated using attendance as measured by completion of online lesson reviews (on the class server), exercises (homework), quizzes (administered on the class server), and examinations (administered on the class server). The exams will derive much of their content from the exercises.

Exercises:

Assignments follow most lectures and are due as listed on the class server. [6].

1. Every homework assignment is to be accompanied by a descriptive memorandum containing your analysis of the problem. Report materials should be prepared with a word processor. Hand computations may be turned in on engineering paper attached as an appendix to the memorandum Legibility is determined by the reader; illegible materials will not be graded.
2. Assignments are to be uploaded to the learning management system (LMS) on the assigned date.[7]

[5]Legitimate reasons include: Academically-related extracurricular activities (ASCE, AGU, etc.); Illness with documentation; Federal Family Leave Act Policies; Orders to activate (Military, Peace Officer, Public Health, etc.). Bring me some kind of documentation for such absences.

[6]Legibility, correct method, and correct answer are substantial components of grading criteria. The grader will not diagnose sources of arithmetic or algebra errors unless the errors are obvious. Solutions are reviewed in class and posted on the server

[7]The use of a LMS (Learning Management System) is an experiment this semester. The LMS is accessed through the course server. If the LMS is not working, then assignments are due by midnight on the due date. Late assignments are not accepted.

3. Due dates are shown in Table **??**; Exercises are denoted by `ES-#`

Engineering Reports:

A project report comprised of various components developed during the course is to be completed. The project is introduced early in the semester and is related to the design of a water distribution, stormwater collection, and/or wastewater collection system and accompanying appurtenances. There are two "reports" on the schedule: `RP-1`, and `RP-2`. The reports are to be constructed as a team activity (teams will be selected in the first two weeks of the semester).

Presentations

An engineering presentation is to be completed and presented to the class for peer evaluation. The topic is the same as in `RP-2`. The report is due by each team on the day of presentation.

Exams:

Two examinations will be given, they will be of approximately equal difficulty.

1. Examinations are open notes.
2. Examinations are comprehensive, even though the main focus will be the materials discussed prior to the examination.
3. Full credit for problems will only be given if all computations are documented.
4. Examination dates are shown in Table **??**.

Grading:

Final grades are determined based on performance during the semester. Letter grades will be assigned using University standards. The **approximate** weighting of graded material in determining the final grade is as follows[8]

[8] Graded materials with fewer than 100 points will have raw scores recorded and will be normalized to 100 points for calculating the final grade.

Item	Percent of Grade
Attendance and Participation	5%
Project Presentation	5%
Project Report-1	10%
Project Report-2	10%
Exercises	20%
Mid-Term Exam	25%
Final Exam	25%

Schedule

DATE	TOPIC	READINGS	STATUS
15 Jan 25	1. Introduction	L1	Need Videos
17 Jan 25	2. Design Guidelines – Drinking Water Supply	L2	Need Video
20 Jan 25	MLK Holiday	no class meeting	
22 Jan 25	3. Design Drawings – Drinking-, Storm-, Wastewater	L3	
24 Jan 25	4. Elevation Maps – By-hand or computer assist, GIS	L4	
27 Jan 25	5. Demand Estimation – Population Projections	L5	
29 Jan 25	6. Pipeline Hydraulics – Head Losses	L6	
31 Jan 25	7. Pipeline Hydraulics – Linked Components	L7	
03 Feb 25	8. Pumps and Pumping Systems	L8	
05 Feb 25	9. Storage Systems	L9	
07 Feb 25	10. Pipe Networks – Background	L10	
10 Feb 25	11. Pipe Networks – Numerical Methods (no pumps)	L11	
12 Feb 25	Job Fair	no class meeting	
14 Feb 25	12. Pipe Networks – Numerical Methods (with pumps)	L12	
17 Feb 25	13. Pipeline Transients – Rigid vs. Elastic Column	L13	
19 Feb 25	14. Pipeline Transients – Numerical Methods (Timed valve closure)	L14	
21 Feb 25	15. EPANET introduction	L15	YouTube
24 Feb 25	16. EPANET pumps	L16	YouTube
26 Feb 25	17. EPANET demand patterns	L17	YouTube
28 Feb 25	18. EPANET water quality	L18	YouTube
03 Mar 25	19. Design Guidelines – Storm Water Collection	Lesson-15	YouTube
05 Mar 25	20. Stormwater Hydrology – Review	Lesson-16	YouTube
07 Mar 25	21. Stormwater Collection – Sizing Inlets	Lesson-17	
10 Mar 25	22. Stormwater Collection – Sizing Conduits	Lesson-17	
12 Mar 25	23. SWMM Introduction	Lesson-18	Need Remake
14 Mar 25	24. SWMM Hydrology	Lesson-19	Need Remake
24 Mar 25	25. SWMM Hydrology	Lesson-19	Need Remake
26 Mar 25	26. SWMM Dual Drainage	Lesson-20	Need Remake
28 Mar 25	27. SWMM Dual Drainage	Lesson-20	Need Remake
31 Mar 25	28. Stormwater Detention Ponds	read	YouTube
02 Apr 25	29. Green-Infrastructure	read	Blackboard
04 Apr 25	30. topic	read	Blackboard
07 Apr 25	31. Design Guidelines – Sanitary Sewer Systems	Lesson-22	YouTube
09 Apr 25	32. Waste Water Collection	Lesson-23	Need Remake
11 Apr 25	33. Self-Study		
14 Apr 25	34.	Lesson-24	
16 Apr 25	35. SWMM & Report Workshop	Lesson-25	

References

Chin, D. (2006). *Water Resources Engineering, 2 ed.* Prentice Hall, Inc.

Mays, L. W. (2011). *Water-Resources Engineering.* Wiley.

Wurbs, R.A., and James, W. P. (2002). *Water Resources Engineering* Prentice Hall; pp.130-156; and 156-198.

NCEES (2008). *Fundamentals of Engineering Supplied Reference Handbook* (8th ed.). 280 Seneca Creek Road, Clemson, SC 29631: National Council of Examiners for Engineering and Surveying ISBN 978-1-932613-37-7.

Roberson, J. A., Cassidy, J. J., and Chaudry, M. H. (1988). *Hydraulic Engineering.* Houghton Mifflin.

Rossman, L. (2000). EPANET 2 users manual. Technical Report EPA/600/R-00/057, U.S. Environmental Protection Agency, National Risk Management Research Laboratory Cincinnati, OH 45268.

Rossman, L. (2009). Storm Water Management Model user's manual version 5.0. Technical Report EPA/600/R-05/040, U.S. Environmental Protection Agency, National Risk Management Research Laboratory Cincinnati, OH 45268.

University Policies

Policies stated in this section override any policies in the course specific policies section above.

These University Operating Policies are provided as directed and cover institutionally required information including: ADA Statement, Academic Integrity, Religious Holy Day Statement.

Additionally the institutionally suggested statements are also included in the syllabus. These statements cover topics related to discrimination, civility, and diversity.

The University ADA Policy is presented verbatim – students requesting accommodations must do so using the procedures defined in the policy.

Certain Statements Required and Recommended for Course Syllabi

Please reference OP 32.06 for comprehensive information about syllabus requirements and faculty responsibility. Following is a brief summary of required and optional inclusions, but the OP provides broader context and explanation. If you want to provide general information about calendars, deadlines, and/or other student services information in your syllabus, please do so by including links to the appropriate institutional websites (e.g., Student Business Services, catalog.ttu.edu, Financial Aid, etc.).

INSTITUTIONALLY REQUIRED INFORMATION TO INCLUDE IN ALL SYLLABI:

ADA STATEMENT:

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note: instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services in West Hall or call 806-742-2405.

ACADEMIC INTEGRITY STATEMENT:

Academic integrity is taking responsibility for one's own class and/or course work, being individually accountable, and demonstrating intellectual honesty and ethical behavior. Academic integrity is a personal choice to abide by the standards of intellectual honesty and responsibility. Because education is a shared effort to achieve learning through the exchange of ideas, students, faculty, and staff have the collective responsibility to build mutual trust and respect. Ethical behavior and independent thought are essential for the highest level of academic achievement, which then must be measured. Academic achievement includes scholarship, teaching, and learning, all of which are shared endeavors. Grades are a device used to quantify the successful accumulation of knowledge through learning. Adhering to the standards of academic integrity ensures grades are earned honestly. Academic integrity is the foundation upon which students, faculty, and staff build their educational and professional careers. [Texas Tech University ("University") Quality Enhancement Plan, Academic Integrity Task Force, 2010]

RELIGIOUS HOLY DAY STATEMENT:

"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused under section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

INSTITUTIONALLY SUGGESTED INFORMATION TO INCLUDE IN ALL SYLLABI

DISCRIMINATION, HARASSMENT, AND SEXUAL VIOLENCE STATEMENT:

Texas Tech University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from gender and/or sex discrimination of any kind. Sexual assault, discrimination, harassment, and other Title IX violations are not tolerated by the University. Report any incidents to the Office for Student Rights & Resolution, (806)-742-SAFE (7233) or file a report online at titleix.gu.edu/students. Faculty and staff members at TTU are committed to connecting you to resources on campus. Some of these available resources are: TTU Student Counseling Center, 806-742-3674, https://www.depts.gu.edu/scc/ (Provides confidential support on campus.) TTU 24-hour Crisis Helpline, 806-742-5555, (Assists students who are experiencing a mental health or interpersonal violence crisis. If you call the helpline, you will speak with a mental health counselor.) Voice of Hope Lubbock Rape Crisis Center, 806-763-7273, voiceonopelubbock.org (24-hour hotline that provides support for survivors of sexual violence.) The Risk, Intervention, Safety and Education (RISE) Office, 806-742-2110, https://www.depts.gu.edu/rise/ (Provides a range of resources and support options focused on prevention education and student wellness.) Texas Tech Police Department, 806-742-3931,http://www.depts.gu.edu/gpd/ (To report criminal activity that occurs on or near Texas Tech campus.)

CIVILITY IN THE CLASSROOM STATEMENT:

Texas Tech University is a community of faculty, students, and staff that enjoys an expectation of cooperation, professionalism, and civility during the conduct of all forms of university business, including the conduct of student–student and student–faculty interactions in and out of the classroom. Further, the classroom is a setting in which an exchange of ideas and creative thinking should be encouraged and where intellectual growth and development are fostered. Students who disrupt this classroom mission by rude, sarcastic, threatening, abusive or obscene language and/or behavior will be subject to appropriate sanctions according to university policy. Likewise, faculty members are expected to maintain the highest standards of professionalism in all interactions with all constituents of the university (www.depts.gu.edu/ethics/matadorchallenge/ethicalprinciples.php).

LGBTQIA SUPPORT STATEMENT*:

I identify as an ally to the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) community, and I am available to listen and support you in an affirming manner. I can assist in connecting you with resources on campus to address problems you may face pertaining to sexual orientation and/or gender identity that could interfere with your success at Texas Tech. Please note that additional resources are available through the Office of LGBTQIA within the Center for Campus Life, Student Union Building Room 201, www.lgbtqia.gu.edu, 806.742.5433."

*If you prefer to list campus resources rather than a statement about ally status, you might include the following among other campus resources you wish to share:

Office of LGBTQIA, Student Union Building Room 201, www.lgbtqia.gu.edu, 806.742.5433 within the Center for Campus Life, the Office serves the Texas Tech community through facilitation and leadership of programming and advocacy efforts. This work is aimed at

strengthening the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) community and sustaining an inclusive campus that welcomes people of all sexual orientations, gender identities, and gender expressions.

TEXAS TECH UNIVERSITY™

Operating Policy and Procedure

OP 10.08: Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act (Section 504)

DATE: March 26, 2013

PURPOSE: The purpose of this Operating Policy/Procedure (OP) is to ensure understanding of the university's responsibilities under the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act (Section 504).

REVIEW: This OP will be reviewed in November of even-numbered years by the senior vice provost and the associate vice provost for student affairs with substantive revisions forwarded to the provost and senior vice president.

POLICY/PROCEDURE

1. **Policy**

   a. The Americans with Disabilities Act (ADA) of 1990 (PL 101-336) mandates equal opportunities for persons with disabilities in all public facilities, programs, activities, services, and benefits derived from them. Section 504 of the Rehabilitation Act of 1973 (PL 93-112), as amended, and PL 93-516 mandate equal opportunity for qualified persons with disabilities in all programs, activities, and services of recipients of federal financial assistance. Both ADA and Section 504 are civil rights statutes that prohibit discrimination on the basis of disability, obligate colleges and universities to make certain adjustments and accommodations, and offer to persons with disabilities the opportunity to participate fully in all institutional programs and activities. Texas Tech University adheres to these regulations and the Texas Commission on Human Rights Act.

   In addition, on September 23, 1996, the U.S. Department of Justice issued certification that the Texas Accessibility Standards, the Texas Architectural Barriers Act, and the Architectural Barriers Administrative Rules meet or exceed the new construction and alterations requirements of Title III of the Americans with Disabilities Act. Texas Tech University is compliant with these regulations.

   b. Texas Tech University provides that all educational and other programs and activities are available to persons with disabilities in the most integrated setting appropriate. Students, employees, applicants, and other individuals with disabilities served by Texas Tech are not segregated, separated, or treated differently on the basis of a disability. Texas Tech University will make reasonable accommodation for the known physical or mental impairment of qualified individuals with disabilities. Reasonable accommodation includes modification or adjustment of a job process that will enable a qualified individual with a disability to perform the essential functions of his or her job.

   c. Texas Tech University does not require persons with disabilities to take advantage of all adjustments, accommodations, or special services that might be available to persons with similar disabilities.

d. Any qualified individual with a disability may request a reasonable accommodation if her/his disability limits one or more life activities, has a record of such impairment, or is regarded as having such impairment. A qualified individual with a disability can perform the essential functions of the position with or without reasonable accommodation.

2. **Procedures**

a. Communications and printed materials for students, employees, and program participants, as well as prospective students, employees, and participants, are accessible to persons who require Braille, large print, taped formats, sign language interpreters, or by Telecommunications Device for the Deaf (TDD). Those requiring such accommodation are requested to notify the appropriate program sponsor within 72 hours of the need for such accommodation so that there will be time to provide accessible materials. Classroom accommodation may take three to five working days notice.

b. The president of Texas Tech University or designee will be responsible for overseeing the reasonable workplace accommodation policy and procedures to ensure compliance. The campus ADA and Section 504 coordinator is the managing director of Student Disability Services, located in West Hall, Room 335, (806) 742-2405. The ADA and Section 504 coordinator will take complaints and concerns regarding compliance issues and direct them to the appropriate entity for attention.

c. Any employee requiring an accommodation shall notify her/his supervisor and inform the supervisor of the nature of the disability. The employee shall provide a medical statement that contains a diagnosis, prognosis, and an evaluation explaining the impact the impairment will have on the employee's ability to perform the essential functions of the employee's position. The statement should also identify the major life activity that is substantially limited as a result of the disability.

d. If the employee is a faculty member, copies of this documentation should be provided to the ADA compliance officer for faculty, the senior vice provost, in the Administration Building, Room 104, (806) 742-2184. In the case of an accommodation for a member of the staff, documentation should be provided to the Office of the Managing Director of Human Resources, Doak Conference Center, Room 166, (806) 742-3851. In the case of a request for accommodation from a student, copies of the documentation should be provided to the managing director of Student Disability Services in West Hall, Room 335, (806) 742-2405. Students should also refer to OP 34.22 for guidelines on establishing reasonable accommodation.

e. Based on the information provided, the university designee assigned to the relevant group, along with the immediate supervisor, will establish procedures for providing reasonable accommodation. In the case of a student, Student Disability Services will consult with all parties to assure that reasonable accommodation is accomplished.

f. If accommodation would constitute an undue hardship for the university in the form of costs involved, impact on operations and business, or risk to the safety of the requestor or others, the university designee and the immediate supervisor, or staff of Student Disability Services in the case of a student, shall prepare documentation stating the reasons for such a decision.

g. Texas Tech University will maintain the confidentiality of all medical and ADA information concerning employees and students. These records will be kept separate from personnel files and will be accessible only to authorized personnel.

3. **Notices**

a. Faculty

(1) Faculty members are required to insert the following into each course syllabus:

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as possible to make necessary arrangements. Students must present appropriate verification from Student Disability Services during the instructor's office hours. Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services office in 335 West Hall or call 806-742-2405.

(2) Faculty members are required to announce the following within the first two class periods:

"I would appreciate hearing from anyone who has a disability that may require special accommodation. I am sure we can work out whatever arrangements are necessary. Please make an appointment with me during my office hours."

b. General Public

(1) The following statement should be included in materials developed and available through the university:

Texas Tech University provides for program accessibility for members of the public. Those requiring accessible materials in Braille, large print, tape format, use of a sign language interpreter, or Telecommunications Device for the Deaf are requested to notify the university at least 72 hours before the need for such services in order that time will be adequate for their preparation.

(2) Such notice should be inserted in university-related programs open to the public.

4. **Grievance**

a. ADA provides for private right of action for injunctive relief, attorney fees, and compensatory damages against both individuals and institutions. At least one person is required to be designated to receive ADA and/or Section 504 grievances and to coordinate an institution's effort under ADA and Section 504. At Texas Tech University, they are as follows:

(1) Employee and Public Concerns – Senior Vice Provost, Administration Building, Room 104, (806) 742-2184.

(2) Student Concerns –Associate Vice Provost for Student Affairs, Student Union Building, Room 201AA, (806) 742-2984.

b. Texas Tech University fully complies with ADA and Section 504 guidelines on employment of people with disabilities. Skills or aptitudes necessary to perform the job are clearly stated and available to applicants.