The University of Texas at El Paso
Department of Civil Engineering

Syllabus - Water and Wastewater Engineering

COURSE INFORMATION

CE 3342: Water and Wastewater Engineering

Term: Spring 2024
CRN: 23850
Delivery Method: In-person
Class Meeting Day and Time: Mondays and Wednesdays, 10:30 am – 11:20 am
Location: Classroom Building C305

CRN: 23851 and 23852
Delivery Method: In-person
Laboratory Meeting Day and Time: Mondays or Wednesdays, 1:30 pm – 4:20 pm
Location: Engineering Building E204

INSTRUCTOR INFORMATION

Instructor: Camila Leite Madeira, Ph.D.

Written Communication: Email and Blackboard
Phone Number: (915)747-5404
Office Location: Engineering Annex, Room 217
Office Hours:

- Face-to-Face: Tuesdays, 3:00 pm to 4:00 pm
- Virtual: By appointment through Teams

COURSE DESCRIPTION

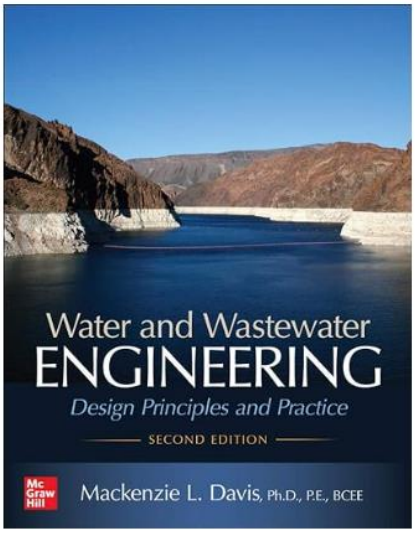
CE 3342 is a required 3-credit course for the Civil Engineering major. The primary goal of CE 3342 is to teach students the physical, chemical, and biological processes involved in conventional water and wastewater treatment plants. The course includes the theoretical principles applied in the design of unit processes that constitute municipal water or wastewater treatment trains. It helps students create preliminary designs for water facilities based on technical considerations such as water quality parameters, current legislation, desired removal efficiencies, location of the plant, capital and operating costs, noise, odor, and aesthetics. In addition, the course aims to raise awareness of water security and the role of engineers in the development and implementation of technologies to ensure equitable access to water and sanitation. The instructional activities and assessment methods used in this course are grounded in learner-centered principles. As an instructor, I aim to help learners improve their critical thinking skills and achieve a higher level of comprehension of factors affecting the design of water and wastewater treatment processes by providing hands-on activities and bringing real-world situations into the classroom. I strongly believe that collaborative learning can positively impact how much students can learn and retain by engaging in discussions with their peers. Thus, this course will involve in-class activities and projects performed in teams.

COURSE OBJECTIVES AND UNIVERSITY LEARNING OUTCOMES

By the end of the course, students will be able to:

Student Learning Objective	**Outcome**
Explain the importance of water and wastewater treatment in global, economic, environmental, and societal contexts.	Social Responsibility
Interpret local, national, and international regulations related to water and wastewater and evaluate challenges related to water safety and access across the world.	Global Awareness
Perform water quality analysis and examine water quality analysis data.	Critical Thinking Skills
Create a preliminary design of conventional coagulation, flocculation, sedimentation, and granular media filtration treatment processes for drinking water.	Problem-Solving Skills
Create a preliminary design of primary, secondary, and tertiary treatment processes and solids management for wastewater.	Problem-Solving Skills
Work in teams to design a water or wastewater treatment process and present your work to the audience.	Communication Skills Teamwork Skills

REQUIRED MATERIALS



Davis (2020) Water and Wastewater Engineering (Second Edition), McGraw Hill

ISBN: 9781260132274

The online version of this textbook is available free of charge through the UTEP Library using the campus network or VPN.

ASSIGNMENTS AND GRADING

Different assessment methods will be used in this course to acknowledge the variety of skills that a student may have.

Grade Distribution:

100-89.5 = A, 89.4-79.5 = B, 79.4-69.5 = C, 69.4-59.5 = D, 59.4 and Below = F

Undergraduate students:

Activities	Percentages
Homework	20%
In-class activities	10%
Laboratory reports	10%
Group Work	10%
Midterm 1	15%
Midterm 2	15%
Final Exam	20%

Graduate students:

Activities	Percentages
Homework	20%
In-class activities	10%
Laboratory reports	10%
Group Work	10%
Graduate student paper	5%
Midterm 1	12.5%
Midterm 2	12.5%
Final Exam	20%

a) Homework: Homework assignments include eight problem sets. The problem sets will be posted on Blackboard and students will have seven days to submit their solutions. Collaboration to solve the problems is permitted and encouraged as long as each student lists their collaborators and submits their own solutions. The solutions will be posted after graded homework is returned.

b) In-class activities: Different activities will be used in the classroom to promote active learning and increase student engagement. Students are expected to submit a short reflection (Exit Ticket) at the end of each lecture describing the most important concept they learned that day and identifying the most confusing or least clear part of the lecture. For full credit, students are expected to submit at least 18 reflections. The grade will be calculated based on the number of reflections submitted by the student assuming that 18 reflections are equivalent to full credit (example: 9 reflections = 50%).

c) Laboratory reports: Each team must submit their reports within seven days of the laboratory sessions. The reports will be assessed according to a rubric, which will be posted on Blackboard. There will be a total of six laboratory reports, but only the five highest grades will be considered.

d) Group work: In Part I, students will be divided into four "focus groups" and each focus group will be given a different text to read and discuss. Each focus group will prepare a 5 to 7-minute presentation on their text. In Part II, two members of each focus group will form a new "task group". These two members will be responsible for presenting their specific topic to the other task group members. At the end of the activity, each task group will submit an assignment containing questions related to the four topics.

e) Graduate student paper: This is an individual assignment. The papers will be assessed according to a rubric. Specific instructions for the paper and the rubric will be posted on Blackboard. The topic chosen for the paper must be previously approved by the instructor.

f) Exams: The exams will be in-person and individual. Students are allowed to have a cheat sheet on the day of the exam, which cannot exceed a letter size (8.5 in x 11.0 in) sheet of paper. Each student must prepare their own cheat sheet. Students are allowed to use a calculator. However, the use of a laptop, tablet, smartphone, or similar technology is not permitted during the exam.

TECHNOLOGY REQUIREMENTS

Some course content is delivered via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have access to a computer/laptop. You will need to download or update the following software: Microsoft Office, Adobe Acrobat Reader, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course.

If you do not have word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about Microsoft Office 365 and follow the instructions.

IMPORTANT: If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP Help Desk as they are trained specifically in assisting with technological needs of students.

iCLICKER

I will be using a cloud-based student response software by iClicker in class this semester. This will help me understand what you know, give everyone a chance to participate in class, and increase how much you learn when we are in class together. This will also provide you with feedback on how well you are comprehending course concepts and help you master challenging concepts. I

will not be using this software to keep track of attendance; please refer to the attendance policy on page 5 of this syllabus. The use of iClicker in this course will not account for your final grade.

You are required to bring a device to participate in my iClicker sessions during class. You can participation with a smartphone, tablet, or laptop. You can download the iClicker student mobile app via the App Store or Google Play, or you can use the iClicker web app by signing in as a student at iclicker.com. It is your responsibility to set up your iClicker Student account in a timely fashion, as well as making sure your device is working properly. If you do not have an existing iClicker student account then you will need to create one to be able to participate in class. You will also need to connect to either UTEP's Wi-Fi (UTEPSecure) or to your mobile data plan while using iClicker.

COURSE COMMUNICATION:

Here are the ways we can keep the communication channels open:

- Office Hours: I will have office hours for your questions and comments about the course. My office hours are in-person, however, you can request a virtual meeting and I will send you a Teams link. Please see the days and times at the top of this syllabus.
- Email: UTEP e-mail is the best way to contact me. I will make every attempt to respond to your e-mail within 24 hours of receipt. When e-mailing me, be sure to email from your UTEP student e-mail account and please put the course number in the subject line. In the body of your e-mail, clearly state your question. At the end of your e-mail, be sure to put your first and last name.
- Announcements: Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

ATTENDANCE AND PARTICIPATION

Attendance in the course is determined by participation in the in-class activities of the course, as previously explained. Attendance in the laboratory sessions is determined by the elaboration of the laboratory reports. Two opportunities for make-up laboratory sessions will be given during the semester. Your participation in the course is important not only for your learning and success but also to create a community of learners.

ILLNESS PRECAUTIONS

Please stay home if you have symptoms of a communicable illness. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations.

EXCUSED ABSENCES AND/OR COURSE DROP POLICY

I will not drop you from the course. However, if you feel that you are unable to complete the course successfully, please let me know and then contact the Registrar's Office to initiate the drop process. If you do not, you are at risk of receiving an "F" for the course.

DEADLINES, LATE WORK, AND ABSENCE POLICY

Assignments: The deadlines to submit the assignments will be posted on Blackboard. If you know you will not be able to submit an assignment prior to the deadline, contact me as soon as possible so we can work on appropriate accommodations. Otherwise, you will receive a penalty of 10% of the grade per late day.

MAKE-UP WORK

Make-up work will be given *only* in the case of a *documented* emergency. Note that make-up work may be in a different format than the original work, may require more intensive preparation, and may be graded with penalty points. If you miss an assignment or exam and the reason is not considered excusable, you will receive a zero. It is therefore important to reach out to me—in advance if at all possible—and explain with proper documentation why you missed a given course requirement. Once a deadline has been established for make-up work, no further extensions or exceptions will be granted.

ALTERNATIVE MEANS OF SUBMITTING WORK IN CASE OF TECHNICAL ISSUES

I strongly suggest that you submit your work with plenty of time to spare in the event that you have a technical issue with the course website, network, and/or your computer. I also suggest you save all your work (answers to discussion points, quizzes, exams, and essays) in a separate Word document as a backup. This way, you will have evidence that you completed the work and will not lose credit. If you are experiencing difficulties submitting your work through Blackboard, please contact the UTEP Help Desk. You can email me your backup document as a last resort.

INCOMPLETE GRADE POLICY

Incomplete grades may be requested only in exceptional circumstances after you have completed at least half of the course requirements. Talk to me immediately if you believe an incomplete is warranted. If granted, we will establish a contract of work to be completed with deadlines.

ACCOMMODATIONS POLICY

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services

(CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, email them at cass@utep.edu, or apply for accommodations online via the CASS portal.

PREFERRED NAME AND PRONOUM

This course affirms people of all gender expressions and gender identities. If you prefer to be called a different name than what is on the class roster, please let me know. Feel free to correct instructors on your preferred gender pronoun. If you have any questions or concerns, please do not hesitate to contact me directly in class or via email (instructor email).

SCHOLASTIC INTEGRITY

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for possible disciplinary action. To learn more, please visit HOOP: Student Conduct and Discipline.

GUIDANCE ON ARTIFICIAL INTELLIGENCE

The use of generative AI tools such as Chat GPT is permitted in this course for the elaboration of laboratory reports, graduate paper, and to answer open-ended homework questions. However, if students opt to use generative AI, they must disclose it and explain how they used the AI tool, as well as report if they were satisfied with the result.

PLAGIARISM DETECTING SOFTWARE

Some of your course work and assessments may submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used review assignment submissions for originality and will help you learn how to properly attribute sources rather than paraphrase.

COURSE RESOURCES:

UTEP provides a variety of student services and support:

Technology Resources

- Help Desk: Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

Academic Resources

- UTEP Library: Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- University Writing Center (UWC): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- Math Tutoring Center (MaRCS): Ask a tutor for help and explore other available math resources.
- History Tutoring Center (HTC): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- RefWorks: A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.
- The Miner Learning Center: Join peer-led study sessions in person or online to review content and discover study strategies in core curriculum courses.
- UTEP Edge: UTEP's cross-campus framework for student success and empowerment – develops students' assets through high-impact experiences made possible by the expertise and dedication of faculty, staff, alumni, and community partners.

Individual Resources

- Student Success Help Desk (SSHD): Students experiencing challenges or obstacles to academic success including registration, financial, food, housing, and transposition resources my submit a ticket request assistance to studentsuccess@utep.edu
- Military Student Success Center: Assists personnel in any branch of service to reach their educational goals.
- Center for Accommodations and Support Services: Assists students with ADA-related accommodations for coursework, housing, and internships.
- Counseling and Psychological Services: Provides a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.
- UTEP Food Pantry: Non-perishable food items are available to students who are currently enrolled in classes. Bring a Miner Gold Card to Memorial Gym, Room 105, Monday through Friday, 10 a.m. to 2 p.m.

COURSE SCHEDULE – SPRING 2024

Week	Day	Lesson	Topic	Textbook	Homework
			Introduction and Overview of Water Treatment		
1	17-Jan	1	Processes	-	
2	22-Jan	2	Water Quality and Legislation	2	
2	24-Jan	3	Water Treatment Overview and Water Chemistry	-	1
3	29-Jan	4	Coagulation	6	
3	31-Jan	5	Flocculation	6	
4	5-Feb	6	Lime-Soda Softening	7	2
4	7-Feb	7	Sedimentation	10	
5	12-Feb	8	Filtration	11	3
5	14-Feb	-	Review	-	
6	19-Feb	-	**Midterm 1**		
6	21-Feb	9	Disinfection and Disinfection Byproducts	13	
7	26-Feb	10	Membrane Processes	12	
7	28-Feb	11	Removal of Specific Constituents	14	4
8	4-Mar	12	**Group Work (Part I)**		
8	6-Mar	13	**Group Work 2 (Part II)**		
9	11-Mar	-	Spring Break		
9	13-Mar	-	Spring Break		
10	18-Mar	14	Wastewater Characteristics and Legislation	18	
10	20-Mar	15	Wastewater Equalization and Primary Treatment	21	5
11	25-Mar	16	Wastewater Microbiology I: Kinetics	22	
11	27-Mar	17	Wastewater Microbiology I: Reactors	22	
12	1-Apr	-	Activated Sludge Processes	23	6
12	3-Apr	-	Review	-	
13	8-Apr	18	**Midterm 2**		
13	10-Apr	19	Nitrogen Removal Processes	23/24	
14	15-Apr	20	Anaerobic Wastewater Treatment Processes	23	7
14	17-Apr	21	Tertiary Treatment	26	
15	22-Apr	22	Sludge Handling and Disposal and Resource Recovery	27	8
15	24-Apr	23	Industrial Wastewater Treatment	-	
16	29-Apr	24	Direct Potable Reuse	29	
16	1-May	-	Review	-	
17	6-May	-	**Final Exam**		

LABORATORY SCHEDULE – SPRING 2024

Week	Lab	Description	Report
1	1	No Lab	
2	2	Lab safety briefing and identification of equipment	1
3	3	pH and Alkalinity	2
4	4	Field trip - Drinking Water Treatment Plant (tentative)	
5	5	Turbidity, Conductivity, TSS and TDS	3
6	6	Spectrophotometry (Chlorine) / Coliforms and E. coli (part I)	
7	7	Coliforms and E. coli (part II) / Make-up Lab	4
8	8	Hardness and Ion chromatography	
9	-	Spring break	
10	9	Field trip - Desalination Plant (tentative)	
11	10	Dissolved oxygen and Chemical Oxygen Demand	5
12	11	Ammonia, Nitrate and Phosphorous	6
13	12	Liquid chromatography	
14	13	Field trip - Wastewater Treatment Plant (tentative)	
15	14	Make-up Lab	