

COURSE SYLLABUS

CIVE 438 FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING

Instructor Information

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Office Hours: MWF 1-2 pm, or e-mail for appointment

Communication Policy: Responses to e-mails with subject line “CIVE 438” or through Canvas will be provided within 36 hours.

Prerequisites for Course: CHEM 113 and CIVE 300 or CBE 331 or MECH 342, or other equivalent courses.

Course Description & Objectives

This comprehensive course covers core topics of Environmental Engineering including water quality and chemistry, wastewater removal and treatment, air pollution, noise pollution, and sanitary landfill design. Sustainability, green engineering and ethics are also discussed.

Upon the completion of this course, students will be able to:

1. identify the environmental problems (e.g. water, air, soil), issues and controversies currently facing us locally, nationally, and internationally,
2. apply science and engineering principles and models to address the identified environmental problems and to design appropriate units for water supply, water and wastewater treatment, solid waste management, air pollution, and noise pollution control,
3. evaluate the efficiency and effectiveness of the designed units,
4. converse with their peers in the Environmental Engineering Profession using the technical language and terminology,
5. obtain a better score at the Environmental Engineering section of the FE and PE Exams.

Assignments' description & Alignment with course objectives

Homework: Problems will be assigned on a ~weekly basis, after coverage of related course content. Due dates and total points are indicated individually for each assignment and the homework will be due **at 5 pm**. Any work submitted later on the submission day, until midnight, will have a 50% reduction in grade. Later submissions will not receive any credit. Although collaboration is allowed and encouraged, final submitted copy should be prepared by individual effort. Homework should be prepared on white or green engineering paper with legitimate writing on only one side. Poor writing, grammar and spelling will affect the grade. Please summarize the question, include a drawing/figure/table if appropriate, box your answer and make sure you show all your solution steps as you may get partial credit even if you don't find the correct answer. Convert your HW to a suitable format for Canvas upload and make sure it is not fuzzy, or too light/dark to read. The solutions and rubrics to the HW will be posted under the corresponding Canvas module.

Quizzes: There will be seven closed books/notes short quizzes (~10-15 minutes long on the indicated dates) from the reading material that will be covered. The quizzes will be through Canvas and will **stay available between 10 am to 12 pm** on the scheduled days. The aim of the quizzes is to prepare you for the material so that you can get

more out of the lectures and formulate questions to clarify the points that you don't understand. See the quiz schedule for dates and related reading for the quizzes.

Exams: There will be **seven closed books/notes** mini exams, that have only **one question, ~30-35 min long each**, on the indicated dates from the noted topic(s) through Canvas. Students are required to clearly show all the work and calculation steps otherwise no credit will be given for just the correct answer. You will need to convert your exam to a suitable format for Canvas upload and make sure it is not fuzzy, or too light/dark to read. See the exam schedule for dates and related chapters.

Discussion: We will utilize the discussion board to keep engaging with each other and discussing topics related to our class. There will be specific prompts for you to work on and reply to. The timeline for these discussions are provided below. Once you post your reply, you will also go through other entries and reply to another student's post. Please review the [core rules of netiquette](#) for some guidelines and expectations on how to behave in an online learning environment. See the D entries in the course schedule for dates.

HW	Date	Assignment	Course Objectives
1	Friday 01/29	Solve problem 7-34	1, 2, 4, 5
2	Monday 02/08	Solve problems 4-35, 4-49, 4-56	2, 4, 5
3	Friday 02/19	Solve 5-34 for exact alk. at pH 10.8 & 6-27, 6-43 (parts 1&2), 6-47, 6-57	1, 2, 3, 4, 5
4	Monday 03/01	Solve problems 8-2, 8-5, 8-11	2, 4, 5
5	Friday 03/05	Solve problems 8-23, 8-26, 8-29 (weir loading rate NOT length), 8-34	2, 3, 4, 5
6	Monday 03/15	Solve problem 4-13 (with details in slides/Canvas)	2, 4, 5
7	Friday 03/19	Complete class handouts for sanitary and storm sewers	2, 4, 5
8	Monday 03/29	See Canvas/Slides for details	1, 4, 5
9	Monday 04/05	Solve problems 9-28, 9-30, 9-34	1, 2, 4, 5
10	Friday 04/23	Solve problems 10-19, 10-24 (see extra details in slides/Canvas)	1, 2, 3, 4, 5
11	Monday 05/03	Solve problems 11-8, 11-29	2, 3, 4, 5

* Please check Canvas announcements for any changes, extra details and clarifications. HW are due at 5 pm.

Quiz	Date	Assignment	Topic
1	Monday 01/25	389-397, 411-413, 425-426, 430-433	Water Quality
2	Friday 02/12	252, 255-257, 270-272, 278-280, 299-303, 309-311, 324, 335-336, 348-351	Water Treatment
3	Monday 02/22	457, 460-462, 464-469, 474, 486-489, 510-511, 517-521, 523, 528, 531	Wastewater Treat
4	Monday 03/08	Hydrology and Sewer System Design Slides	Sewer Design
5	Monday 03/22	582-584, 588-591, 604-605, 609-613, 623, 628-633, 647, 653, 657	Air Pollution
6	Monday 04/19	704-705, 707, 714, 738, 741, 747, 757, 758, 763	Noise Pollution
7	Monday 04/26	786, 790, 794-795, 805-807, 812-813, 816, 819-820, 825-826, 830-833	Landfill Design

*Students are highly encouraged to read through the whole chapter to study the example problems, to get help with their homework and to prepare for the exams. Quizzes are available between 9-11 am, and will be timed at 15 minutes. Hint: Check out discussion points at the end of the slides!

Exam	Date	Time	Topics (as a guide)
1	Friday 02/05	TBA	Chapter 7
2	Friday 02/26	TBA	Chapters 5, 6
3	Friday 03/12	TBA	Chapter 8
4	Friday 04/02	TBA	Sewer Notes
5	Friday 04/23	TBA	Chapter 9
6	Friday 04/30	TBA	Chapter 10
7	Friday 05/07	TBA	Chapter 11

* See Canvas announcements for any changes, extra details and clarifications. Exams are ~30 mins long.

Discussion	Date	Discussion	Date
1	Friday 01/22	6	Friday 03/05
2	Friday 01/22	7	Monday 03/29
3	Monday 02/01	8	Monday 04/05
4	Friday 02/05	9	Monday 04/26
5	Monday 02/15	10	Monday 05/03

* Please check Canvas calendar for extra details, deadlines and clarifications.

Course Schedule – Alignment of Course Topics, Learning Outcomes, and Assessments

WEEK OF	TOPIC/SUB-TOPIC	LEARNING OUTCOME(S) ALIGNMENT	ASSIGNMENT/ ASSESSMENT(S)*	Chapter
01/19	Introduction, Physical Processes Review	1, 2, 3, 4, 5	Read syllabus, D-1, D-2	2, 7
01/25	Water Pollution/Quality	1, 2, 4, 5	Q-1, HW-1	7
02/01	Water Demand, Supply, Distribution	1, 2, 4, 5	D-3, D-4, E-1	Handouts, 4.6, 4.7
02/08	Chemistry Review, Water Treatment	1, 2, 4, 5	Q-2, HW-2	5, 6
02/15	Water Treatment continued	2, 3, 4, 5	HW-3, D-5	6
02/22	Wastewater Treatment	1, 2, 4, 5	Q-3, E-2	8
03/01	Wastewater Treatment continued	2, 3, 4, 5	HW-4, HW-5	8
03/01	Sustainability and Green Engineering	1, 4, 5	D-6, Bonus Quiz	13
03/08	Hydrology Review, Wastewater Collection	1, 4, 5	Q-4, E-3	4.2-4.5
03/15	Sanitary and Storm Sewer System	2, 4, 5	HW-6, HW-7	Handouts
03/15	Engineering Ethics	1, 4, 5	Bonus Quiz	Handouts
03/22	Air Pollution	1, 2, 3, 4, 5	Q-5, E-4	9
03/29	Air Pollution Continued	2, 4, 5	HW-8, D-7	9
04/05	Noise Pollution	1, 2, 3, 4, 5	HW-9, D-8, E-5	10
04/12	Spring Break!		Have fun!!!	-
04/19	Solid Wastes	1, 2, 4, 5	Q-6, HW-10	11
04/26	Solid Wastes Continued	1, 2, 4, 5	Q-7, D-9, E-6	11
05/03	Wrap Up	1, 2, 3, 4, 5	HW-11, D-10, E-7	

*Q: Quiz, HW: Homework, E: Exam, D: Discussion

Textbook / Course Readings

Davis, M.L. and Cornwell, D.A. 2012. Introduction to Environmental Engineering, 5th Edition, McGraw-Hill. ISBN: 978-0-07-340114-0.

The book may be obtained from the CSU bookstore, online vendors, or through publisher's website in an electronic format.

Course Materials & Equipment

N/A

Participation/Behavioral Expectations

Students are encouraged to stay in touch with the instructor during office hours and through e-mail and Canvas messaging. It is expected that the students would spend around 12 hours working on/accessing the course each week.

Please review the [core rules of netiquette](#) for some guidelines and expectations on how to behave in an online learning environment.

Course Policies

- E-mails regarding the course should contain **CIVE 438 in the subject line**, and a proper salutation in the main text of the e-mail.
- You may also utilize the messaging on Canvas.
- Students are highly encouraged to utilize the office hours to discuss any issues and difficulties related to the course material.
- All the quizzes and exams are closed books, closed notes, with no outside help. Only **FE approved basic calculators** that have no programming and solver capabilities are allowed. Students will be supplied with a formula sheet during the exams.
- Any previous HW solution, quiz, exam material and solution manual are **off limits** and will be accepted as **cheating** if utilized. Please see the honor pledge.
- Students have **one week** to discuss their quiz/exam/homework after they are graded.
- If a student has a conflict with an exam, the instructor should be notified at least **two weeks** prior to the exam date. Make-ups won't be given for missed exams without a prior **notice and an official document**, or with an **official document** for **acceptable emergencies**.
- Grades will be posted regularly in Canvas so that students may keep up to date with their standing in the course. Course materials and announcement will also be uploaded to Canvas.

Grading Policy

GRADE	RANGE
A+	100% to 96.67%
A	<96.67% to 93.33%
A-	<93.33% to 90.0%
B+	<90.0% to 86.67%
B	<86.67% to 83.33%
B-	<83.33% to 80.0%
C+	<80.0% to 76.67%
C	<76.67% to 70.0%
D	<70.0% to 60.0%
F	<60.0% to 0.0%

CSU does not use grades of C-, D+, or D-.

As a student enrolled in this course, one of your responsibilities is to submit course work by the due dates listed. With that said, I take my role as your instructor very seriously, and, in fact, I care about how well you do in this course and that you have a satisfying, rewarding experience.

To that end, it is my commitment to you to respond individually to the work you submit in this class and to return your work in a timely manner. Smaller, weekly assignments and quizzes will be returned within 3 days and major assignments, exams, and essays will be returned within 7 days. (If, however, due to unforeseeable circumstances, the grading of your work takes longer than the times I have listed here, I will keep you informed of my progress and make every effort to return your work with feedback as soon as I can.)

ASSIGNMENT	GRADE POINTS	GRADE PERCENTAGE
Discussions	40	4
Homework	200	20
Quizzes	200	20
Exams	560	56
Total:	1000	100 %

*Keep a copy of all work created for the course, including work submitted through Canvas course learning management system.

Canvas Information & Technical Support

Canvas is the where course content, grades, and communication will reside for this course.

Login: canvas.colostate.edu Support: info.canvas.colostate.edu

For passwords or any other computer-related technical support, contact the [Central IT Technical Support Help Desk](#).

Voice: (970) 491-7276 Email: help@colostate.edu

The [Technical Requirements](#) page identifies the browsers, operating systems, and plugins that work best with Canvas.

Academic Integrity & CSU Honor Pledge

This course will adhere to the [CSU Academic Integrity/Misconduct](#) policy as found in the General Catalog and [the Student Conduct Code](#).

Academic integrity lies at the core of our common goal: to create an intellectually honest and rigorous community. Because academic integrity, and the personal and social integrity of which academic integrity is an integral part, is so central to our mission as students, teachers, scholars, and citizens, I will ask that you affirm the CSU Honor Pledge as part of completing your work in this course.

Further information about Academic Integrity is available at CSU's [Academic Integrity - Student Resources](#).

Universal Design for Learning/Accommodation of Needs

I am committed to the principle of universal learning. This means that our classroom, our virtual spaces, our practices, and our interactions be as inclusive as possible. Mutual respect, civility, and the ability to listen and observe others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner. A verifying memo from [The Student Disability Center](#) may be required before any accommodation is provided.

The Student Disability Center (SDC) has the authority to verify and confirm the eligibility of students with disabilities for the majority of accommodations. While some accommodations may be provided by other departments, a student is not automatically eligible for those accommodations unless their disability can be verified and the need for the accommodation confirmed, either through SDC or through acceptable means defined by the particular department. Faculty and staff may consult with the SDC staff whenever there is doubt as to the appropriateness of an accommodative request by a student with a disability.

The goal of SDC is to normalize disability as part of the culture of diversity at Colorado State University. The characteristic of having a disability simply provides the basis of the support that is available to students. The goal is to ensure students with disabilities have the opportunity to be as successful as they have the capability to be.

Support and services are offered to student with functional limitations due to visual, hearing, learning, or mobility disabilities as well as to students who have specific physical or mental health conditions due to

epilepsy, diabetes, asthma, AIDS, psychiatric diagnoses, etc. Students who are temporarily disabled are also eligible for support and assistance.

Any student who is enrolled at CSU, and who self-identifies with SDC as having a disability, is eligible for support from SDC. Specific accommodations are determined individually for each student and must be supported by appropriate documentation and/or evaluation of needs consistent with a particular type of disability. SDC reserves the right to ask for any appropriate documentation of disability in order to determine a student's eligibility for accommodations as well as in support for specific accommodative requests. The accommodative process begins once a student meets with an accommodation's specialist in the SDC.

Copyrighted Course Materials

Please do not share material from this course in online, print, or other media. Course material is the property of the instructor who developed the course. Materials authored by third parties and used in the course are also subject to copyright protections. Posting course materials on external sites (commercial or not) violates both copyright law and the CSU Student Conduct Code. Students who share course content without the instructor's express permission, including with online sites that post materials to sell to other students, could face appropriate disciplinary or legal action.

Undocumented Student Support

Any CSU student who faces challenges or hardships due to their legal status in the United States and believes that it may impact their academic performance in this course is encouraged to visit [Student Support Services for Undocumented, DACA & ASSET](#) for resources and support. Additionally, only if you feel comfortable, please notify your professor so they may pass along any additional resources they may possess.

Title IX/Interpersonal Violence

For the full statement regarding role and responsibilities about reporting harassment, sexual harassment, sexual misconduct, domestic violence, dating violence, stalking, and the retaliation policy please go to: [Title IX – Sexual Assault, Sexual Violence, Sexual Harassment.](#)

If you feel that your rights have been compromised at CSU, several resources are available to assist:

- Student Resolution Center, 200 Lory Student Center, 491-7165
- Office of Equal Opportunity, 101 Student Services, 491-5836

A note about interpersonal violence: If you or someone you know has experienced sexual assault, relationship violence and/or stalking, know that you are not alone. As instructors, we are required by law to notify university officials about disclosures related to interpersonal violence. Confidential victim advocates are available 24 hours a day, 365 days a year to provide support related to the emotional, physical, physiological and legal aftermath of interpersonal violence. Contact the Victim Assistance Team at: 970-492-4242.

Religious Observances

CSU does not discriminate on the basis of religion. Reasonable accommodation should be made to allow individuals to observe their established religious holidays. Students seeking an exemption from attending class or completing assigned course work for a religious holiday will need to fill out [the Religious Accommodation Request Form](#) and turn it in to the Division of Student Affairs, located on the second level of the Administration building.

Once turned in, the Division of Student Affairs will review the request and contact the student accordingly. If approved, the student will receive a memo from the Dean of Students to give to their professor or course instructor.

Students are asked to turn in the request forms as soon as the conflict is noticed. Similarly, unanticipated conflicts requiring a religious observance, such as a death in the family, can also be reviewed.

CSU Principles of Community

Inclusion: We create and nurture inclusive environments and welcome, value and affirm all members of our community, including their various identities, skills, ideas, talents and contributions.

Integrity: We are accountable for our actions and will act ethically and honestly in all our interactions.

Respect: We honor the inherent dignity of all people within an environment where we are committed to freedom of expression, critical discourse, and the advancement of knowledge.

Service: We are responsible, individually and collectively, to give of our time, talents, and resources to promote the well-being of each other and the development of our local, regional, and global communities.

Social Justice: We have the right to be treated and the responsibility to treat others with fairness and equity, the duty to challenge prejudice, and to uphold the laws, policies and procedures that promote justice in all respects.

Diversity and Inclusion

Respect for Diversity: It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, religion, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you." - [Source](#)

Mental Health and Wellness

Need Help? CSU is a community that cares. If you are struggling with drugs, alcohol and/or experiencing depression, anxiety, overwhelming stress or thoughts of hurting yourself or others, please know there is help available.

Your student fees provide access to a wide range of support services located in the **CSU Health and Medical Center** (Corner of Lake and College). Trained professionals are available 24/7 to help you identify which services are right for you.

Visit [CSU Health Network Counseling Services](#) or Call (970) 491-6053

If you are concerned about a distressed friend or peer, share your concerns with a trained professional at **Tell Someone**. They can help you discreetly connect the individual with the proper resources. Rams Take Care of Rams. Reach out and ask for help if you or someone you know is having a difficult time.

Visit the [TELL SOMEONE website](#) or call (970) 491-6053