

1 Course Number and Name

- a. **CENG 3351:** Introduction to Environmental Engineering
- b. Section 010, TR 8:00 – 8:50 am
- c. Laboratory section 01Z, W 11:00 am – 1:50 pm; section 02Z R:2:00 pm – 4:50 pm

2 Credits and Contact Hours

- a. **Credits:** 3
- b. **Contact Hours:** 2 hours/week (Classroom), 3 hours/week (Lab)

3 Instructor Information

- a. **Course Coordinator:** Soyoon Kum
- b. **Instructor:** Soyoon Kum, 325-486-5508, soyoon.kum@angelo.edu. Office: VIN 282. For office hours see [faculty homepage](#)¹.

4 Required Course Materials

- a. Required text materials:
 - Cornwell, D. A.; Davis, M. L. Introduction to Environmental Engineering, 5th ed.; McGraw-Hill Education, 2012. (ISBN: 978-0073401140)
 - National Council of Examiners for Engineering and Surveying (NCEES). Fundamentals of Engineering (FE) Supplied–Reference Handbook, 280 Seneca Creek Road, Clemson, SC 29631. Which can be downloaded for free after creating an account in the [NCEES Website](#)².
- b. **Software** None.
- c. **Other Supplemental Materials:** Posted on Blackboard® Learning Management System

5 Specific Course Information

- a. **Catalog Description:** Introduction to environmental problems, water quality indicators and requirements, potable water quality and quantity objectives, water sources and treatment methods; water pollution control objectives and treatment methods; solid waste management and introduction to air pollution control.
- b. **Prerequisites:** Chemistry 1311, 1111; Completion or concurrent enrollment in Engineering 2302.
- c. **Required or elective:** Required (satisfies Introductory CE Discipline)

6 Specific Goals for the Course

Students who successfully complete this course will be able to:

- 1) Understand various environmental systems and describe environmental legislation and regulation
- 2) Write and solve mass and energy balances in the appropriate units.
- 3) Describe a typical treatment train in a drinking water or wastewater treatment plant.
- 4) Identify sources of aqueous pollution and indoor and outdoor air pollution; calculate pollutant concentrations within natural and engineered environments.

- 5) Describe the mass transfer mathematically and calculate partitioning coefficient of pollutants in environmental compartments.
- 6) Quantify health risks for exposure to a contaminant and calculate risk of contaminants.
- 7) Perform common environmental experiments relating to water and wastewater quality in a team, and know which tests are appropriate for given environmental problems.
- 8) Statistically analyze and interpret laboratorial results and write technical laboratorial reports.

Course Learning Outcome Mapping to ABET Criterion 3 Student Outcomes is shown in Table 1.

Table 1: Course Learning Outcomes mapped to ABET Student Outcomes

ABET Student Outcomes	1	2	3	4	5	6	7	8
1. Solve Problems		X		X	X	X		X
2. Design								
3. Communication			X	X				
4. Ethics & Professionalism	X					X		
5. Teamwork							X	X
6. Experimentation							X	
7. Acquire New Knowledge	X		X	X				

7 Topics Covered

- 1) Environmental Legislation & Regulation and Environmental Ethics
- 2) Units/Mass Balances/Energy Balances
- 3) Environmental Chemistry
- 4) Natural water contaminant transport
- 5) Physical, chemical, and biological processes in water and wastewater treatment
- 6) Mass transfer between environmental phases
- 7) Solid waste and hazardous waste management
- 8) Air pollution
- 9) Risk assessment

8 Course Delivery and Communications

8.1 Delivery Method

This is a face-to-face course with two components: two 50 minutes lectures per week and one 170 minutes lab session per week. To take maximum advantage of this time, you are expected to have done the reading assigned for each class period beforehand. Please bring the textbook, any relevant handouts, and a calculator with you to the class. All additional course resources and reading materials will be available on the [Blackboard](#). This syllabus is subject to change. An instructor's posting to the Blackboard will be considered written notification of any changes to the syllabus or class requirements. Accommodations will be made for students who are in quarantine or isolation and are unable to attend.

8.2 Communications

You may communicate with me via Blackboard discussion board, email, or phone. I will respond to email within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday. Written communication via email: All private communication will be done exclusively through your ASU email address. Check frequently for announcements and policy changes. In your emails to faculty, include the course name and section number in your subject line. Office hours or advising may be arranged with the assistance of Collaborate, Zoom, or another web meeting platform

8.3 Lab session policy

On-time attendance of lab sessions is REQUIRED, and students are expected to attend ALL lab sessions including field trips (if there is any). Students who miss a specific laboratory or field trip will receive a grade of ZERO for that assignment. Make up labs are not possible, and no exceptions will be made. Students are expected to prepare for each lab by reading assignments prior to class. No food or drink is allowed in the lab area. LATE WORK: Students will NOT be permitted to make up missed lab periods unless an emergency or unavoidable cause can be identified and approved.

8.4 Calculator policy

The use of a calculator is required and allowed on all exams and quizzes. Computers, tablets, smart phones, I-pads, and similar electronics are not allowed on quizzes and tests. Calculators with graphing capabilities will be allowed in the course. Recommended calculators with these capabilities include the HP48, HP49, HP50, TI86, and TI89. However, only calculators currently allowed in the Fundamentals of Engineering (FE) and Professional Engineering (PE) exams will be allowed in exams and quizzes. Please refer to the National Council of Examiners for Engineering and Surveying (NCEES) calculator policy for the list of acceptable calculators (<http://ncees.org/exams/calculator-policy/>)³.

9 Professionalism

Professional engineering standards apply in this class. You are expected to demonstrate a behavior consistent with the conduct of an individual practicing in the engineering profession. You are expected to: (1) come prepared for class; (2) respect faculty and peers; (3) demonstrate responsibility and accountability for your own actions; (4) demonstrate sensitivity and appreciation for diverse cultures, backgrounds, and life experiences; (5) offer and accept constructive criticism in a productive manner; (6) demonstrate an attitude that fosters professional behavior among peers and faculty; (7) be punctual to class meetings; (8) maintain a good work ethic and integrity; and (9) recognize the classroom as a professional workplace.

10 Graded Material

10.1 Homework

There will be several homework assignments during the semester. Problem sets are posted on Blackboard assignment folder and generally due 1 week after being assigned. Most homework assignments are individual work (Lab report is not considered as a homework assignment). Handwritten assignments must be completed on engineering paper before being scanned and

submitted via Blackboard. You must include homework title, question number, student name(s), course name, instructor name, and due date. Homework answer without the question number is considered as no answer. See details of format of Homework assignment in Section 13.

Using homework or homework solutions from previous semesters is not allowed. Homework will be graded using the following scale in Table 2 and the grader will subtract 1 point for a problem that is sloppy or has a lack of systematic presentation.

Table 2: Homework grading rules

Points	Description
100%	Correct solution, both methodologically and numerically; carefully presented, easy to follow
80%	Correct methodologically, but with minor computational or table look-up errors, leading to erroneous final answer.
60%	Some conceptual error(s) but correct general approach
40%	Major conceptual errors.
20%	Completely missed the point of the problem but made some attempt at a solution.
0%	Did not attempt problem.

10.2 In-class quizzes

You will be able to submit answers to in-class quizzes at the beginning of each laboratory session using any smartphone, tablet, or laptop via Blackboard. Questions for quizzes are based on materials provided by the instructor before each lab session via Blackboard. The purpose of the in-class problems is to encourage you to participate actively in lab sessions and complete the reading and web-based material. Your lowest score will be dropped.

10.3 Group activities

There are two or three group activities throughout the semester. The details for the group activities will be provided in class before each group activity. Examples of group activity are mind map and a short research presentation.

10.4 Lab report

You must complete the lab portion of the class to pass the course. The instructor will post the handouts for every lab in Blackboard at least one week in advance of the session. Ensure to read them in advance to be prepared for the quiz and lab activity. Most sessions require submission of a professionally written report submitted as a team. 10% of the lab report grade will be based on a self and peer evaluation. Unless stated otherwise each lab report will be due at the beginning of the lab session, one week after the lab is completed. Detailed lab report guideline will be available via Blackboard.

10.5 Examinations

There will be two - 50-minute exams. Each examination will be closed book with one page cheat sheet and will be given in class on the date indicated. The exams will cover lecture material, lab material, and assigned reading material. Missed examinations may be made up only if the reason for missing was illness or some other emergency. The final exam will take place during finals. While this exam will focus on the material presented in the half of the class, it is in some sense cumulative because we will be applying the fundamental principles developed in the first half of the course to more advanced topics presented at the end of the semester.

10.6 Grades: Weighting and Letter Grades

The weighting system shown in Table 3 will be used in determining final grade for the course

Table 3: Grade Weighting

Item	Percent
Homework	20%
In-class quizzes	10%
Group activities	15%
Lab report	20%
Exams (2)	Midterm 15% / Final 20%
	100%

The instructor will determine letter grades for the course using his professional judgment, and the following standards as described in the University Catalog:

A = excellent work B = good work C = average work D = poor work F = failing work

10.7 Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](#)⁴ for more information.

11 Classroom and University Policies and Student Support

All students are required to follow the policies and procedures presented in the [Angelo State University Student Handbook](#)⁵ and [Angelo State University Catalog](#)⁶.

11.1 Accommodations for Students with Disabilities

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the [Student Disability Services website](#).⁷ The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112

11.2 Title IX at Angelo State University

Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You may submit reports in the following manner:

Online: [Incident Reporting Form](#)⁸
Face to Face: Mayer Administration Building, Room 210
Phone: 325-942-2022
Email: michelle.miller@angelo.edu

Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).

For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit the [Title IX website](#).⁹

11.3 Student Absence for Observance of Religious Holy Days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for [Observance of Religious Holy Day](#)¹⁰ for more information.

11.4 Information About COVID-19

Please refer to ASU's [COVID-19 \(Coronavirus\) Updates](#)¹¹ web page for current information about campus guidelines and safety standards as they relate to the COVID-19 pandemic.

11.5 Student Conduct Policies

11.5.1 Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

11.5.2 Plagiarism

Plagiarism is a serious topic covered in ASU's [Academic Integrity policy](#)¹² in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality via Turnitin or SafeAssign. Resources to help you understand this policy better are available at the [ASU Writing Center](#)¹³.

11.5.3 Copyright Policy

Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

12 Course Outline

The course outline is presented in Table 4. Detailed reading and homework assignments along with updates to this schedule will be provided via Blackboard. The following schedule may be modified as the semester progresses.

Table 4: Course Lesson Outline

Week	Date	Lecture Topic	Laboratory Topic	Homework /Exam
1	8/24 8/26	Introduction Various environmental systems	Lab Safety Training	
2	8/31 9/2	Environmental legislation and regulation Environmental Ethics	Environmental lab instruments	Homework #1
3	9/7 9/9	Units Mass Balance I	pH and Color	
4	9/14 9/16	Mass Balance II Mass Balance III	Suspended Solids	Homework #2
5	9/21 9/23	Environmental Chemistry I Environmental Chemistry II	Alkalinity	
6	9/28 9/30	Natural water contaminant transport I Natural water contaminant transport II	Hardness	Homework #3
7	10/5 10/7	Water Quality parameters I Water Quality parameters II	Chlorine	
8	10/12 10/14	Water Quality parameters III Drinking water treatment I	Jar test	Homework #4
9	10/19 10/21	Drinking water treatment II Drinking water treatment III	Field trip (Drinking water treatment plant)	
10	10/26 10/28	Group Activity: mind map Mid-term Exam	No Lab session	Mid-term Exam
11	11/2 11/4	Wastewater treatment I Wastewater treatment II	Biological oxygen demand	
12	11/9 11/11	Wastewater treatment III Solid and Hazardous Waste Management I	Chemical oxygen demand	Homework #5
13	11/16 11/18	Solid and Hazardous Waste Management II Solid and Hazardous Waste Management III	Ion chromatography	
14	11/23 11/25	Air Pollution No class (Thanksgiving)	No Lab session	None
15	11/30 12/2	Risk Assessment I Risk Assessment II	Group Activity: research presentation	Homework #6
16	12/7	Final Exam (Date to be announced)	No Lab session	Final exam

End Notes

- ¹ <https://www.angelo.edu/live/profiles/11378-soyoon-kum>
- ² <https://account.ncees.org/reference-handbooks/>
- ³ <https://ncees.org/exams/calculator/>
- ⁴ <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>
- ⁵ <http://www.angelo.edu/student-handbook/>
- ⁶ <https://www.angelo.edu/academics/catalog/>
- ⁷ <https://www.angelo.edu/current-students/disability-services/>
- ⁸ <https://www.angelo.edu/incident-form>
- ⁹ <https://www.angelo.edu/title-ix>
- ¹⁰ <http://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>
- ¹¹ <https://www.angelo.edu/covid-19/>
- ¹² <http://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>
- ¹³ http://www.angelo.edu/dept/writing_center/academic_honesty.php