CEE 390: Fundamentals of Environmental Engineering

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Office hours: Monday afternoons, 2-4 pm. Also, immediately after class or by appointment. Appointments are best scheduled by e-mail.

Optional Study Session: Each week, the class grader will have a short study session to go over example problems relevant to the homework. Time and location to be announced.

Course Topics
This course provides a broad overview of the terminology and practice of environmental engineering including water and air quality engineering and hazardous waste management.

Course Approach and Objectives
Our existence, quality of life, and well being are completely dependent upon our environment. Environmental considerations affect all societal decisions, and increasing population pressures, scarcity of resources, and examples of environmental degradation necessitate that the decisions you make as a scientist, engineer, and individual consider their environmental impacts. This course will provide you with an introduction to the environmental problems you will face as an engineer along with some of the quantitative tools and concepts used to address those problems. Unlike many basic science problems you have been introduced to, in environmental engineering (and engineering in general) there is rarely a single, well-defined “correct” answer, but rather a range of solutions, ranging in quality from excellent to poor. The objective of this course is to develop the judgment to make informed scientific decisions, order of magnitude estimates, simplifying assumptions, and creative problem solving that are fundamental to engineering practice as you cope with the uncertainty that is inherent to all “real-world” problems.

Prerequisites
You must have completed either CHEM 121: General Chemistry or CHEM 201: General Chemistry for Scientists and Engineers to take this course.

Grading

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<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>20%</td>
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<tr>
<td>Exam 2</td>
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<tr>
<td>Cumulative Final Exam</td>
<td>35%</td>
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<td>Final Exam: Mon, May 11, 9:45-11:45</td>
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<tr>
<td>Homework</td>
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<tr>
<td>Writing Assignment</td>
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Grades are based on knowledge and application of the course materials and concepts. Students receiving: “A” grades thoroughly understand all of the course work and its applications; “B” grades understand all of the major concepts and most of the minor ones; “C” grades understand
the major concepts; “D” grades do not understand the materials presented in class despite complete participation on the part of student and instructor; “F” grades are reserved for those who do not grasp any of the material, did not attend lecture or demonstrate effort, or violated the generally accepted university code of conduct.

**NOTICE:** At the end of the semester, **all grades are final.** If an error was made in the determination of your grade, it will be corrected. Your grade in this course is based entirely on your performance on the exams and homework assignments. If you are having trouble with material in this course, please come and talk to me. If you need help, ask me and study with your classmates. You will NOT have the opportunity to complete additional work at the end of the semester to improve your grade.

**Homework**

- Homework will consist of weekly problem sets. If a student performs poorly in this course, it is usually because they chose to neglect their homework.

- It is acceptable to discuss homework with classmates, however, **copying homework from classmates is completely unacceptable** and may merit disciplinary action. Please confine homework discussions to approaches to problems. In general, homework is not worth all that much relative to exams, so the more you rely upon the expertise of classmates to develop homework solutions, the more difficult the exam will seem to be for you. Struggling with homework problems may take more time and effort, but often the reward for such perseverance is better performance on exams. Choose wisely.

- One writing assignments will be due over the course of the semester. This assignment will be announced 1-2 weeks in advance of the due dates, and will cover current topics in environmental engineering.

- All assignments are to be handed in at the beginning of class on the due date, generally Wednesdays. Assignments must be submitted in class, not to the instructor’s office or mailbox. **Late assignments will not be accepted, and merit a grade of “0”**.

- If the class period in which an assignment is due is canceled, the assignment will be due at the beginning of the next class period.

**Exams**

- One in-class exam is scheduled approximately every 5-6 weeks. The exact date of each exam will be announced as the class progresses, at least a one week in advance.

- **If the class period in which an exam is scheduled is canceled, the exam will be given during the next class period.**

- The in-class exams typically cover material not covered on the previous in-class exam. The final exam is cumulative.

- Exams will be difficult. Exams test coursework, along with the student’s approach, logic, analytical and problem solving skills. Exams may cover materials in the text book, lecture material, and handouts, but focus upon concepts discussed in lecture and homework.

**Attendance**
Attendance is expected for each and every lecture. **In accordance with university policy, any student may be dropped from the course for non-attendance upon indication of the instructor.** If you know that you will be missing a class period, please let me know in advance.

**Textbook and Course Materials**

2. Supplemental handouts and notes.

**Expectations for Students**

1. Turn off your cell phone before each and every class, and pray that I don’t know who you are if such a distraction occurs.
2. No food or drink is to be brought into the classroom if it will cause a distraction (slurping, rustling, etc.)
3. No talking with classmates during class, or other behavior that will cause a distraction.
4. Questions, class participation, and discussion of class concepts during class are strongly encouraged and will be rewarded.
5. Behavior towards fellow students, the TA, and the professor must be respectful and tolerant.

**Academic Standards for Students**

*The following guidelines will be strictly enforced.*

Every student enrolled at the University of Nevada, Reno agrees to abide by, and make every effort to meet, the academic and behavioral standards of the university. The maintenance of academic standards is a joint responsibility of the students and faculty of the university. Freedom to teach and to learn are dependent upon individual and collective conduct to permit the pursuit and exchange of knowledge and opinion. Faculty have the responsibility to create an atmosphere in which students may display their knowledge. This atmosphere includes an orderly testing room and sufficient safeguards to inhibit dishonesty. Students have the responsibility to rely on their knowledge and resources in the evaluation process. The trust developed in the maintenance of academic standards is necessary to the fair evaluation of all students.

**Academic dishonesty** is against the university standards as well as the system community standards. Academic dishonesty is defined as cheating, plagiarism, or otherwise obtaining grades under false pretenses. Plagiarism is defined as submitting the language, ideas, thoughts, or work of another as one’s own; or assisting in the act of plagiarism by allowing one’s work to be used in this fashion. Cheating is defined as: (1) obtaining or providing unauthorized information during an examination through verbal, visual, or unauthorized use of books, notes, text, and other materials; (2) obtaining or providing information concerning all or part of an examination prior to that examination; (3) taking an examination for another student, or arranging for another person to take an exam in one’s place; (4) altering or changing test answers after submittal for grading, grades after grades have been awarded, or other academic records once these are official.

Disciplinary procedures for incidents of academic dishonesty may involve both academic action and administrative action for behavior against the campus regulations for student conduct. The
procedures involve the determination by the faculty member pursuing concerns over alleged cheating or plagiarism as to whether administrative action is warranted, in addition to making a determination as to any academic consequence. Academic action may include: (1) canceling the student’s enrollment in the class without a grade; (2) filing a final grade of “F”; (3) awarding a failing grade on the test or paper in question; (4) requiring the student to retake the test or resubmit the paper.

If the student wishes to appeal the academic action of the faculty member, a special hearing board will be constituted to investigate the incident and determine whether the student is responsible for dishonesty and, if so, the appropriate academic action as a consequence for this act. The student will be entitled to receive notice of the academic charges and the opportunity to reply to or to rebut the charges before an unbiased board.

**Tentative Course Outline**

**Chapter 1, Mass and Energy Transfer:** 1 week
- Units of Measurement, Materials Balance

**Chapter 3, Mathematics of Growth:** 1 week
- Population Growth, Half-Life

**Chapter 4, Risk Assessment:** 1 week
- Perception of Risk, Human Exposure Assessment

**Chapter 2, Environmental Chemistry:** 2 weeks
- Stoichiometry, Chemical Equilibria

**Chapter 5, Water Pollution:** 3 weeks
- Water Pollutants, Surface Water, Groundwater

**Chapter 6, Water Quality Control:** 2 weeks
- Water Treatment, Wastewater Treatment

**Chapter 7, Air Pollution:** 1-2 weeks
- Criteria Pollutants, Control Systems

**Chapter 8, Global Atmospheric Change:** 1 week
- Global Warming

**Chapter 9, Solid Waste Management and Resource Recovery:** 1/2 week
- Municipal Solid Waste

**Special Topics, Challenges for the Developing World, Societal Sustainability:** 1 week