CEE 458/658: Fundamentals of Environmental Chemistry

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Office hours: Monday afternoons, 2-4 pm. Also by appointment. Appointments are best scheduled by e-mail, or just try stopping by.

Course Topics
This course provides an overview of environmental chemistry as it applies to the practice of environmental engineering and science. After completing this course, you will be able to solve acid-base/alkalinity, metal speciation and dissolution, and basic redox chemistry problems.

Course Approach and Objectives
Contrary to popular belief, chemistry is not scary, or even all that difficult. Most people see the word “chemistry” and pretty much shut off their brain, making anything they then try to learn about chemistry difficult, intimidating, and stressful. The reality of chemistry problems is that once you understand some of the fundamentals, gain some comfort with the terminology and language of chemistry (which does take some time and practice), and learn a few basic approaches to solving chemistry problems, most of the problems reduce to algebra and are easily solved. Therefore, it is the objective of the course to teach you those fundamental concepts, increase your comfort level with the terminology and language of chemistry, and apply some basic approaches to solving chemistry problems commonly faced by environmental engineers and scientists. Once you have learned these skills, I hope that you’ll be able to see chemistry problems as (mostly) basic high school level math problems. The skills you will learn in this class can then be applied to understand the vast majority of chemistry issues associated with contaminant fate and transport, process design and optimization, and environmental engineering.

Prerequisites
You must have completed CHEM 121: General Chemistry (C or better) or CHEM 201: General Chemistry for Scientists and Engineers, and CEE 390: Fundamentals of Environmental Engineering, to take this course.

Grading
Exams (2) = 50%
Cumulative Final Exam = 30% Date: Monday, May 11, 12:00-2:00
Homework = 20%
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. Plus/minus grades are used. Graduate students will be graded separately, and will be expected to attain 10% higher achievement than undergraduates for comparable grades.

**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 normally 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 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.

- 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. There is never enough time.

**Attendance**
Attendance is expected in class, and your performance in the class will benefit from attending all lectures. **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.
6. Students with disabilities may contact the instructor.

**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**

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