



## Syllabus for ENVE020-01: Intro to Environ Sci and Tech

Spring 2017

Instructor: Wolfgang Rogge

<b>Designation:</b>	EnvE 20 Introduction to Environmental Science & Technology
<b>Catalog Description:</b>	Introduction to historical and current issues in the diverse field of environmental engineering. Principles of mass and energy balance. In-depth analysis of several key innovations from the field that have been instrumental in advancing the field. Design project.
<b>Text Books and Other Required Materials:</b>	1) Mackenzie L. Davis and David A. Cornwell, Introduction to Environmental Engineering, Fifth Edition, McGraw-Hill. ISBN: 978-0-07-340114-0 2) Class notes, handouts, and library references.
<b>Course Objectives/ Student Learning Outcomes:</b>	<p>Course Objectives are:</p> <ol style="list-style-type: none"><li>1) to introduce students to local and global environmental problems and their impact on human health, welfare, natural systems, and natural resources and the needs of society;</li><li>2) to develop a basic understanding of major portions of environmental regulations;</li><li>3) to teach the fundamental concepts of mass and energy balance applied to man-made and natural environmental systems;</li><li>4) to instill a basic understanding of risk and risk assessment and how it applies to the assessment of environmental problems;</li><li>5) to relate theory to real environmental problems and develop problem-solving, design, and engineering decision-making skills necessary to improve environmental systems.</li></ol> <p>Student Learning Outcomes:</p> <p>Assessment of learning outcomes is here in terms of students developing skills to (1) apply knowledge of mathematics, science, and environmental engineering, (2) design a system, component, or process to meet desired needs, (3) describe and explain major state and federal environmental rules and laws, as well as international treaties, and given violations of the aforementioned decide on the best course of action and justify the decision, (4) be able to write effective short communications and environmental problem discussions addressed to engineering peers, and (5) achieve understanding of the complexity of environmental issues and identify possible negative local, global and/or societal consequences and be able to recommend solutions to minimize or avoid those. The learning outcomes will be evaluated through course-embedded assessments on homework, tests, exams, writing, and presentations using a rubric (set of scoring criteria developed for ABET).</p>
<b>Program Learning Outcomes:</b>	
<b>Prerequisites by Topic:</b>	CHEM 010 MATH 021
<b>Course Policies:</b>	a) Attendance and Participation: It is imperative that you avoid missing classes, be on time and stay the entire lecture period.

b) Readings: Our textbook is mostly excellent. For the success of interactive learning and problem solving, it is paramount that you come to class prepared and ready to ask questions on whatever you might not have understood in the book chapter. Even if not explicitly advised, you are responsible to read ahead so that you are prepared for the next class meeting.

c) In-class student problem solving: In order to facilitate learning, supervised independent learning and in-class exposure to problem solving are very helpful. Consequently, I will demonstrate example problems together with you in class. Similarly, if time allows, you will be giving a problem to be solved in-class by either all students individually or in groups. During in-class problem solving, you will have the opportunity to ask questions and request my assistance. For longer problems, you will be asked to finish a given problem at home and bring the solution to class next time for discussion.

d) Assignments: Homework assignments will consist of 6 to 12 problems each and are due on set day at the very beginning of the class. Your homework must be an individual effort, unless otherwise indicated. Begin your homework as soon as it is assigned.

Your handed-in homeworks serve as proof that you did do the homework by yourself. In order to get points for your homework, you have to go to UC CatCourses "Quizzes" and answer questions to each homework problem. Questions could include for you to select intermediate or final result, solution pathway, result discussion or other relevant issues. The UC CatCourses homework questions will be available at least 24 hours prior to the homework due date and ends 30 min before class begins. You can only one time select an answer to a question! Therefore, it is paramount that you finish all your homework problems before assessing the online system.

Each problem in your homework should be exactly labeled with the problem number used in the book, problem stated, approach to solve problem shortly summarized, and all partial and/or final results clearly labeled. Each problem has to briefly summarize the problem in "Problem Statement", and what is to be found in "Find". Next, briefly summarize your assumptions and approach in "Assumptions and Approach" and present your solution under the heading "Solution". If the result obtained needs discussion, then provide this under the heading "Discussion". For each step in the solution, equations used need to be shown in it's parametric form, followed by numbers with units replacing the variables and parameters. Most important, your solution has to show the flow of your thought process in solving the problem. An example homework layout will be shown during the first class and posted on UC CatCourses.

e) Chapter Multiple Choice Tests: After completion of a chapter in our text book, there will be an online multiple choice test covering the respective chapter. The test can be found under "Quizzes" on UC CatCourses. Typically, after we are done with a chapter, I will announce the test and you will then have typically at least 1 day to go online and do the test. The test is timed and can only be taken one time.

f) We will have two mini projects in this class that cover contemporary environmental issues in society and most likely relate to sustainability by proposing change to wasteful habits and novel engineering solutions. Each mini project team should consist of at least 2 students and maximum 3 students. For

each mini project, a report has to be typed (1 1/2 spaced, minimum 8 pages, plus references) and handed-in in paper form as well as uploaded. Typically, you have three weeks to work on your mini project.

g) Web Site: Homework assignments as well as important announcements (deadline changes, exam dates, etc.) will be posted on the course web site: <https://catcourses.ucmerced.edu>. It is important that you get comfortable with using this system early in the semester.

h) Cell phones and computers: Please turn off cell phones and pagers before entering the classroom. Cell phone usage during exams and tests automatically invalidates the test or exam, receiving zero points. No texting or emailing during class! During in-class exams, you cannot use laptop computers, iPads, or any other computer type system. You are not allowed to go online during an exam!

**Academic Dishonesty Statement:**

- a. Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work.
- b. You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e mail, an e mail attachment file, a diskette, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action.
- c. During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

**Disability Statement:**

Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

**Topics:**

Material Balances  
Risk Assessment  
Water Resources Engineering - Groundwater & Wells - only  
Water Chemistry  
Water Treatment  
Water Pollution  
Wastewater Treatment - partially  
Air Pollution  
Solid Waste Management - partially  
Hazardous Waste Management - partially  
Sustainability - partially  
Tues & Thurs.: 13:30 - 15:20; Classroom Bldg. 276

**Class/laboratory****Schedule:**

**Midterm/Final Exam Schedule:** Midterm Exam: Thurs., March 9th (110 min.); Final Exam: Fri., May 12th from 11:30-14:30, (180 min.). The final exam is comprehensive.

**Course Calendar:** 2 hours lectures, twice per week

**Professional Component:** Engineering Science - 60%

Engineering Problem Solving and Design - 40%

**Assessment/Grading Policy:** HW 20%

Mini-Projects 15%

Chapter Multiple Choice - 20%

Midterm - 20%

Final Exam - 25%

**Coordinator:** Wolfgang F. Rogge

**Contact Information:** Office: SE2-380  
wrogge@ucmerced.edu  
(209) 228-4543

**Office Hours:** TR 12:00 - 13:00  
or by appointment