UNIVERSITY OF CALIFORNIA
MERCED

Course Syllabus

Introduction to Environmental Science & Technology - EnvE 20

Fall 2018

Tuesday & Thursday 3:30 pm – 5:20 pm, GLCR 125

Course Description: This course is an introduction to historical and current issues in the diverse field of Environmental Engineering. It will cover the principles of mass and energy balance and present an in-depth analysis of several key innovations that have been instrumental in advancing the field. Participation in a design project is required.

Course Objectives and Learning Outcome: Upon the successful completion of this course, you will:

- Gain skill and experience in applying scientific and mathematical principles to the framing of environmental problems
- Exercise critical thinking, problem-solving and computational skills to interpret and solve environmental problems
- Gain experience in designing an environmental process
- Gain experience in working as part of a diverse and inclusive team
- Improve oral, written and graphical presentation skills in the context of Environmental Engineering
- Understand the importance of professional and ethical behavior in the context of Environmental Engineering
- Gain an appreciation of broader societal and global complexities and implications of environmental engineering
- Gain exposure to modern techniques and tools commonly implemented in different Environmental Engineering sub-disciplines

Instructor: Abbas Ghassemi, Ph.D. Emeritus Professor
Senior Lecturer; Civil and Environmental Engineering
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Office hours: Wednesdays 9:30-11:30 am or by request **Office location:** COB 380

Grading Assistant: TBD

Textbook: Mihelcic and Zimmerman (2014). *Environmental Engineering Fundamentals, Sustainability, Design*, 2nd Edition, John Wiley & Sons. ISBN: 978-1-118-74149-8

Prerequisites: Chem 010 - General Chemistry II or Chem 010H – Honors General Chemistry II and Math 021 – Calculus I. *If you do not meet the prerequisites, you are not allowed to take this course without prior approval/written authorization, otherwise you will be dropped from the course.*

Course Content, Exams and Project: The course and related content covered as well as exams are expected to include:

- Environmental measurements, the chemistry of environmental systems, mass and energy balance, reactor theory and mass transport; (Chapters 1 - 4). Review and Exam 1 - **Tentative date:** Oct. 4th

- Ecosystems, material and energy flow in ecosystems, risk assessment, water supply and demand, water usage and municipal demand, surface and ground water quality and flow; (Chapters 5 - 7).
  Review and Exam 2 - **Tentative date:** Nov 1st

- Water and wastewater treatment, solid waste management and air quality; (Chapters 8 - 11). Review and Exam 3 - **Tentative date:** Dec. 6th

Exams will be held in class and cover the cumulative materials covered prior to the exam. *No makeups for missed exams.* If an exam is missed due to illness, an emergency or other unexpected situation, the final exam score can replace the missed exam. This must be done with prior approval of the instructor.

Class Project: Starting in mid-September, students will be working on a team project focused on one or more topics from class. This project will be presented to the class and summarized in a written report.

Final project identification and introduction	Oct. 4th
Final project progress report due	Nov 1st
Class presentations 6:30-9:30 PM	Dec. 10th

Grading and Scale:

Homework	5%
Participation	5%
Quiz	10%
Exam 1	20%
Exam 2	20%
Exam 3	20%
Final Project Report	20%

100 - 90% A; 89 - 80% B; 79 - 70% C; 69 - 60% D; <60% F

The upper 1/3 of each grade range will receive "+" in the grade and the lower 1/3 will receive "–" in the grade; i.e. 97-100 A^+ and 90-93 A^-, 87-90 B^+ and 80-83 B^-, etc.

The instructor reserves the right to revise this grading plan. Grades may be given using a Curved Grading system.

Homework and quizzes will include concept questions and problems. NO extensions are given on homework. Homework will be posted on CatCourses and will be due by the start of the class. Approximately 10 homework assignments will be given on a weekly to biweekly basis and will be due on the date indicated. *Late homework will not be accepted and NO extensions are given on homework.* Homework will not be strictly graded, but will be checked for completeness and professional appearance. You are free to collaborate with other students on the work, but you must make an honest effort, (exam problems will be similar to homework problems). Quizzes will be in class and un-announced. *No make-up is offered for missed quizzes.*

You are expected to attend class. Completion of the course depends on your attendance. The main delivery of course information will be via lectures and in-class workshops, so attendance is important. Please arrive to class on time, silence your cell phone during class and respect other's opinions during discussions.

The instructor will use CatCourses for uploading lectures, the syllabus, and communicating with students via "announcements" and email.

Academic Integrity: Academic integrity is the foundation of an academic community and without it none of the educational or research goals of the university can be achieved. All members of the university community are responsible for its academic integrity. Existing policies forbid cheating on quizzes and exams, plagiarism and other forms of academic dishonesty.

- Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Work submitted in this course for academic credit must be the student's own work.
- You are encouraged to **study together and to discuss information and concepts covered in lecture with other students**. You can give/receive "consulting" help to/from other 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 email, an e-mail attachment file, a flash drive, 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 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.
- For exams and the final report, **you must do your own work**. Discussing the report with the instructor and classmates is encouraged in order to receive feedback and improve your work. However, **sharing figures and text is unacceptable**.

Academic dishonesty is prohibited and is considered a violation of the UCM policy. ***Scholastic dishonesty is a serious offence and will not be tolerated.***

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. The instructor is available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

Diversity and inclusion: This class is conducted in accordance to the UC Merced Principles of Community https://www.ucmerced.edu/principles-of-community which include the recognition and celebration of all identities, values, and beliefs. Discrimination on the basis of race, religion, sex, sexual orientation, gender identity, national origin, citizenship, documented status, or any other social identity will not be tolerated. All students are invited to discuss any situation they perceive as harmful or threatening with the instructor in class or during office hours

Course Schedule – Fall 2018 (Ghassemi)

Lecture	Date	Topic(s)	Reading in Text
1	Aug 23	Logistics; Overview and Introduction	Ch 1
2	Aug 28	Environmental measurements	Ch 2
3	Aug 30	Chemistry 1	Ch 3.1 – 3.4
4	Sep 4	Chemistry 2	Ch 3.5 - 3.6
5	Sep 6	Chemistry 3	Ch 3.7 - 3.11
6	Sep 11	Mass balances	Ch 4.1
7	Sep 13	Reactor theory 1	Ch 4.1
8	Sep 18	Reactor theory 2	Ch 4.1
9	Sep 20	Energy balances	Ch 4.2
10	Sep 25	Mass Transport	Ch 4.4
11	Sep 27	Review session **Final project introduction**	Ch 1 - 4
12	**Oct 2**	**EXAM #1**	**Ch 1 - 4**
13	Oct 4	Ecosystems, energy flow in ecosystems	Ch 5.1 – 5.4
14	Oct 9	Material flow in ecosystems	Ch 5.5 – 5.6
15	Oct 11	Risk	Ch 6.1 – 6.6
16	Oct 16	Water supply and demand	Ch 7.1 – 7.3
17	Oct 18	Water usage and municipal demand	Ch 7.4 – 7.6
18	Oct 23	Surface water quality	Ch 7.7 – 7.9
19	Oct 25	Groundwater quality and flow	Ch 7.10
20	Oct 30	Review session **Final project progress report DUE**	Ch 5 - 7
21	**Nov 1**	**EXAM #2**	**Ch 5 - 7**
22	Nov 6	Water treatment 1	Ch 8.1 – 8.4
23	Nov 8	Water treatment 2	Ch 8.5 - 8.7
24	Nov 13	Water treatment 3	Ch 8.8 – 8.11
25	Nov 15	Wastewater treatment 1	Ch 9.1 – 9.5
26	Nov 20	Wastewater treatment 2	Ch 9.6 – 9.9
--	Nov 22	**Non-instructional day (no lecture)**	---------
27	Nov 27	Solid Waste management	Ch 10
28	Nov 29	Air quality	Ch 11.1 – 11.5
29	Dec 4	Review session	
30	Dec 6	EXAM #3	Ch 8 - 11
***	Dec 10	**Class presentations 6:30-9:30 PM**	**Upload final report**