CIV ENG 111 – Environmental Engineering

1. **Course Description:** Credit hours: 3 Units
   Quantitative overview of air and water contaminants and their engineering control. Elementary environmental chemistry and transport. Reactor models. Applications of fundamentals to selected current issues in water quality engineering, air quality engineering, air quality engineering, and hazardous waste management.

2. **Course Learning Objectives and Outcomes:**
   The objectives of the course are to introduce the basic theory and concepts of environmental engineering. Successful completion of the course will allow the students to develop a fundamental understanding environmental engineering processes.

3. **Instructor and Lectures**

   Dr. Baoxia Mi (mib@berkeley.edu)
   Associate Professor, Department of Civil and Environmental Engineering
   Lecture*: Mon, Wed, Fri 1:00 pm – 2:00 pm
   **Lecture may be offered synchronously (live) or asynchronously (review pre-recorded lecture before class and participate in discussion during class)*
   Join Lecture Zoom Meeting:
   https://berkeley.zoom.us/j/96503682765?pwd=c1NOc3RPVlFGUVB4cmdPdDBMTU1tZz09
   Meeting ID: 965 0368 2765 Passcode: 6c744o

   Office Hours: Mon 12:00 pm – 1:00 pm
   Mon 5:00 pm – 6:00 pm
   Fri 2:00 pm – 3:00 pm
   ***Mi Office Hour Zoom Meeting*:** https://berkeley.zoom.us/j/3359551243

4. **GSIs and Discussion Sessions:**

	Synchronous Discussion#	Office Hours
Rebecca Sugrue rasugrue@berkeley.edu	Mon 4:00 pm – 5:00 pm	Tue 6:30 pm – 8:00 pm Thu 9:30 am – 11:00 am
	Zoom links can be found on bCourses	
Sidney Poon sidney_poon@berkeley.edu	Wed 2:00 pm – 3:00 pm	Tue 11:00 am – 12:30 pm Wed 10:00 am – 11:30 am
	Zoom links can be found on bCourses	
Monong Wang monong_wang@berkeley.edu		Mon 2:00 pm – 2:30 pm^ https://berkeley.zoom.us/j/6188058498

   #Discussion sessions are designed to reinforce lecture materials, solve homework problems, and answer common questions.
   ^Monong's office hour is offered to answer questions on homework grading only.

5. **Course Materials:**
   Textbook: WW Nazaroff and L Alvarez-Cohen, Environmental Engineering Science, Wiley, 2001.
   Additional handouts for some lectures.

To enhance your remote-learning experiences, we are sharing lecture/discussion videos and notes on bCources. Course material, including all video, note and handout, is copyrighted and reposting to third party sites or any other form of redistribution is prohibited.

6. **Grading:**
   Homework – 20%
   Project – 10%
   Midterm Exam 1 – 20%
   Midterm Exam 2 – 20%
   Final Exam – 30%
   Grading Scale: A(±) 90-100%, B(±) 80-89%, C(±) 70-79%, D 60-69%, F <60%

7. **Class Policy:**

   - **Exams** will be open-book, open note. Please prepare pencil and calculator for each exam. Students should show independent work during the exams. No sharing or discussion is allowed. We will use Zoom to proctor exams. You may send private chat to TA/Instructor to ask clarifying questions, but no chat between students are allowed. We will follow the university policy to arrange make-up exams. *Only excused absences* with sufficient proving document and notification time will be considered for exam make-ups.
   - **Questions offline** will be handled using Piazza. Please sign up at: https://piazza.com/berkeley/fall2020/ce111/home. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com.
   - **Homework** will be typically due one week after the assignment. *No late homework will be accepted*. To provide some flexibility in case of family issues, illness, etc., *your lowest homework score will be dropped before computing overall scores for the semester*.
   - **Academic Honesty**: You are encouraged to discuss homework problems with other students and work on the problems collaboratively, but you must not share your homework solutions with others or copy anyone else's homework.
   - **Berkeley Honor Code:** *Everyone in this class is expected to adhere to this code*: As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others.
   - **Accommodation Policy**: We honor and respect the different learning needs of our students. If you need *disability accommodations* in order to have full access to this course, please contact The Disabled Students' Program (DSP). DSP is the campus office responsible for authorizing disability-related academic accommodations. Students who need academic accommodations, or have questions about their eligibility, should contact DSP: Students may call 642-0518 (voice), 642-6376 (TTY), or e-mail dsp@berkelely.edu.
   - **Inclusion**: We are committed to creating a learning environment welcoming of all students that supports a diversity of thoughts, perspectives and experiences, and respects your identities and backgrounds (including race/ethnicity, nationality, gender identity, socioeconomic class, sexual orientation, language, religion, ability, etc.) To help accomplish this:

- If you have a name and/or set of pronouns that differ from those that appear in your official records, please let us know.
- If you feel like your performance in the class is being impacted by your experiences outside of class (e.g., family matters, current events), please don't hesitate to come and talk with us. We want to be resources for you.
- We (like many people) are still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to us about it. You may also contact the CEE department's Faculty Equity Advisor Prof. Variano (variano@berkeley.edu).
- As a participant in this class, recognize that you can be proactive about making other students feel included and respected.

➢ **Zoom Policies:**

- We will use Zoom for all synchronous meetings (i.e., some lectures, discussion sections and office hours). Activate your free UC Berkeley Zoom account and always join the Zoom meeting with your Berkeley account.
- Please keep the Zoom link private—do not share with anyone outside of the course.
- Please set your Zoom name to be the name you would like the instructors to call you. You may optionally include your personal pronouns, e.g. Becca (she/her). We encourage that you set your Zoom picture to an appropriate profile picture of you.
- We encourage participating in class and discussion with your video on to foster a sense of community and enhance interactions. However, we understand that some students are not comfortable with video or may not be able to participate by video.
- Please leave your audio on mute during lecture/section, but be prepared to unmute yourself to ask or answer questions or participate in discussion.
- If possible, please join with a computer with a camera and microphone (built-in or external) as it will give you the best access to content.
- We understand that your specific situation may present challenges to class participation. Please contact the GSI if you would like to discuss your ability to access course material. The Student Technology Equity Program (STEP) is available to help students get access to a laptop, Wi-Fi hotspot, and other peripherals.
- We will use Zoom chat as a mechanism to build community and foster information and resource sharing among students. To these ends, chat will be enabled during our sections. The same expectations for respectful communication hold for chat as they do for face to face interaction.

➢ **Resources:**

- ***Counseling and Psychological Services*:** The main University Health Services Counseling and Psychological Services staff is located at the Tang Center (http://uhs.berkeley.edu; 2222 Bancroft Way; 642-9494) and provides confidential assistance to students managing problems that can emerge from illness such as financial, academic, legal, family concerns, and more. To improve access for engineering students, a licensed psychologist from the Tang Center also holds walk-in appointments in 241 Bechtel Engineering Center (check here for schedule: https://engineering.berkeley.edu/student-services/advising-counseling).
- ***The Care Line (PATH to Care Center):*** The Care Line (510-643-2005; https://care.berkeley.edu/care-line/) is a 24/7, confidential, free, campus-based resource for urgent support around sexual assault, sexual harassment, interpersonal violence, stalking, and

invasion of sexual privacy. The Care Line will connect you with a confidential advocate for trauma-informed crisis support including time-sensitive information, securing urgent safety resources, and accompaniment to medical care or reporting.

8. Group Project:

(1) *By Sep 15:* Signup for a group project; select a topic that is most interesting to you
(2) *Group work:* Work with roughly 5 people in each group, search media to find an appropriate case study related to the selected topic, prepare a 5-minute presentation (~5 powerpoint slides)
(3) *Through the semester between Week 5 and Week 15*: Be ready to present your case study (*live or recorded*) to the class when the related topic is covered; turn in the powerpoint slides on bcourses.
(4) *Last week*: submit a three-page paper (12 Times New Roman, 1.5 line-spacing) to give a more extensive discussion of the case study.
(5) Scores will be given to individual student: each group will receive a group score; the score that everyone receives will be adjusted based on their contribution to the project (a survey will be conducted at the end of the semester).

9. **Course Outline:**

Week	Date	Contents	Text Chapter
1.	Aug 26 – 28	Introduction	
2.	Aug 31 – Sep 4	Mass and energy balance, stoichiometry	Ch.1, Ch.3
	Sep 7 (Mon)	No Class	
3.	Sep 9 – 11	Chemical equilibrium, reaction kinetics	Ch. 3
4.	Sep 14 – 18	Reactors	Ch. 5
5.	Sep 21 – 25	Impurities in environmental media	Ch. 2, Ch.4
6.	Sep 28 – Oct 2	Water and nutrient cycle	Handouts
	Oct 5 (Mon)	Midterm Exam 1	
7.	Oct 7 – 9	Water quality engineering	Ch. 6B
8.	Oct 12 – 16	Physical treatment: sedimentation, media filtration, membrane filtration, adsorption	Ch. 4, Ch.6C
9.	Oct 19 – 23	Chemical treatment: coagulation, flocculation, precipitation, softening, disinfection	Ch. 6D
10.	Oct 26 – 30	Biological wastewater treatment	Ch. 6E
11.	Nov 2 – 6	Zero-energy wastewater treatment, wastewater reuse, desalination	Handouts
	Nov 9 (Mon)	Midterm Exam 2	
	Nov11 (Wed)	No Class	
12.	Nov 13	Climate change	Ch. 7
13.	Nov 16 – 20	Air quality engineering	Ch. 7
14.	Nov 23 Nov 25 – 27	Environmental sustainability Thanksgiving break, No Class	Handouts
15.	Nov 30 – Dec 4	Hazardous waste management, risk assessment	Ch.8
	Dec 7 – 11	Reading Week, No Class	
	Dec 16 (Wed)	Final Exam 7:00 pm – 10:00 pm	

Prepared by: Baoxia Mi, PhD **Date:** 08/12/2020