

CE 3131 Environmental Analysis Lab

Spring 2018

Instructor: Prof. Hyeok Choi
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Office Hours: Mon/Wed 12:00-14:00 pm or by appointment

Section Information: 3131-001 (21761), 3131-002 (21762), and 3131-003 (26004)

Lab Schedule: Section 001: Tuesday 14:00-16:50
Section 002: Wednesday 14:00-16:50
Section 003: Thursday 14:00-16:50

Classroom: Nedderman Hall B08 (basement)

Class communication: Communication between students and instructor will be maintained via e-mail.

Description of Course Content: The major goal of this course is to familiarize students with 1) the procedures used in the analysis and 2) the environmental significance of various water quality parameters in assessing the water quality, uses, and treatment methods.

Student Learning Outcomes:

Students will be able to

- Design and conduct the experiments.
- Analyze and interpret the data from the laboratory experimental results.
- Communicate effectively by producing the high quality technical report.

Requirements: A few of laboratory experiments may require students to return to the lab outside of normal class hours to take readings.

Required Text: Laboratory Descriptions and CE 3334 Notes. Laboratory Descriptions will be posted on Blackboard. Link to the Blackboard: <https://elearn.uta.edu>.

References: Chemistry for Environmental Engineering, Sawyer, McCarty, and Parkin, 4th Edition, McGraw-Hill, 1994.

Water Quality, Tchobanoglous and Schroeder, Addison and Wesley, 1987.

Wastewater Engineering: Treatment and Reuse, 4th Edition, Metcalf & Eddy, McGraw-Hill, 2003.

Standard Methods for the Examination of Water and Wastewater, American Public Health Association, 2005.

Descriptions of Major Assignments and Examinations

Group Assignment: Laboratory work will be performed in groups of 4 students, and only raw data and basic information will be shared by group members.

Laboratory Report: Each Lab report will have two parts of submission. Instructions for the part I and part II lab reports are given in the “Instruction for preparing the notebook and laboratory reports”. Part I of the lab report will be submitted as a single group report and for the part II lab report submission, each student will be responsible for data interpretation, accuracy and assumptions and will submit his/her own individual report.

List of lab reports and the due dates are given under “List of Lab Experiments” and “Laboratory Schedule and Assignments”. There will be no make-up opportunities for missed laboratory experiments. Students that miss a lab session without a written medical excuse or an excuse approved by the instructor will receive a grade of zero for the lab report. Students presenting proper documentation of an excused absence will have the missed laboratory assignment excluded from their grade.

Exams: There will be one midterm exam and one final exam. Students that miss the exam without a written medical excuse or an excuse approved by the instructor will receive a grade of zero for the exam. Students presenting proper documentation of an excused absence will have to schedule the make-up test within 3 days of the return. No makeup exam for the final.

Quizzes: Every lab the students have to come prepared for the quizzes, but quiz may or may not be given. All the given quizzes will have equal weighting. The quizzes will be given in the first 10 minutes of the lab. No make-up opportunities for the missed quizzes. Students presenting proper documentation of an excused absence will have the missed quizzes excluded from their grade.

Laboratory Notebook: Each student will be required to record his/her data in a laboratory notebook. Laboratory notebook will be separate from class notebook. The laboratory notebook must be submitted at the time of the final exam.

Attendance: At The University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator in student success. Each faculty member is free to develop his or her own methods of evaluating students’ academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, Participation in each laboratory session is mandatory for successful completion of the course. Students that miss a lab session without a written medical excuse or an excuse approved by the Instructor will be dropped from the class roll. If past the automatic drop date, the student will be dropped with a grade of "F". However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.” UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student a grade of F, faculty report the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Blackboard. This date is reported to the Department of Education for federal financial aid recipients.

Grading Policy: Grades will be determined according to the following scale (*The instructor reserves the right to vary the grade scale listed below.*)

90 – 100 %	A
80 - 89.9 %	B
70 - 79.9 %	C
60 - 69.9 %	D
Below 60 %	F

Students will be required to accumulate points from the following:

Midterm	15%
Final Test	15 %
Quiz	10%
Laboratory Reports / Homeworks	50%
Laboratory Notebook	10 %

Submission of lab reports and homework: *Students must submit the assignments on the blackboard.*

Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels.

Grade Grievances: Grade grievances will be handled according to the policy described in the College of Engineering portion of the Catalog.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://wweb.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of a letter certified by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting: The Office for Students with Disabilities (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and

policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability. Counseling and Psychological Services (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.*

Title IX Policy: The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.*

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents’ Rule* 50101, §2.2, suspected violations of university’s standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student’s suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

Lab Safety Training: Students registered for this course must complete all required lab safety training prior to entering the lab and undertaking any activities. Once completed, Lab Safety Training is valid for the remainder of the same academic year (i.e., Fall through Summer II) and must be completed anew in subsequent years. There are no exceptions to this University policy. Failure to complete the required training will preclude participation in any lab activities, including those for which a grade is assigned.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are as-

signed a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as “lecture,” “seminar,” or “laboratory” are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback via the SFS database is aggregated with that of other students enrolled in the course. Students’ anonymity will be protected to the extent that the law allows. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: for semester-long courses, a period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, which is located at left and connected to upper stairways (will be demonstrated during the 1st and 2nd weeks). When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include [tutoring](#), [major-based learning centers](#), developmental education, [advising and mentoring](#), personal counseling, and [federally funded programs](#). For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a

message to resources@uta.edu, or view the information at <http://www.uta.edu/universitycollege/resources/index.php>.

Civil Engineering Librarian: Martin Wallace, Engineering Librarian. Mailing address: Central Library, Office Number: 518. Phone: 817-272-3924, Email: martin.wallace@uta.edu

List of Lab Experiments

Experiment	Title	Description	Report
1	Solids	Determine total suspended and dissolved solids; and total volatile and fixed solids in given samples.	Report 1
2	Turbidity	Determine turbidity of given lake water, raw, primary effluent, secondary effluent and effluent of waste water.	
3	Normality	Determine normality of given standard solution	Report 2
4	Alkalinity	Determine pH, phenolphthalein and total alkalinities of given lake water, tap water, and lake water spiked with sodium hydroxide.	
5	Hardness	Determine total hardness of given lake water and tap water.	Report 3
6	Jar Testing	Determine optimum coagulant dose by conducting coagulation study in given primary effluent waste water.	Report 4
7	Ammonia nitrogen	Determine ammonia nitrogen in given raw waste water, effluent waste water, and tap water.	Report 5
8	DO	Determine temperature and dissolved oxygen (DO) of given lake water, tap water, and synthetic water.	Report 6
9	BOD	Determine biochemical oxygen demand (BOD ₅) of given primary treated wastewater.	Report 7
10	COD	Determine chemical oxygen demand (COD) in given raw municipal wastewater and secondary effluent municipal wastewater.	
11	Study Experiment, Analytical Lab Visiting, or Make-up	Study Experiment : Demonstration will be done for determination of total coliform in primary effluent wastewater, or Analytical Laboratory Visiting: Discussion on environmental instrumentation, including LC, GC, IC, TOC, and UV-Vis, will be made and analytical and environmental laboratories visiting will be followed with brief operation demonstration, or Makeup Lab: Any missing experiment is possibly covered.	No report required

Laboratory Schedule and Assignments*

Week	Date**	Lab Topics	Note, Report, and Assignment
1	1/16-1/18	Course and Syllabus Discussion (CE 3334 lecture pending) (Lab preparation)	-Lab safety training
2	1/23-1/25	Lab Safety Lecture/Lab Guidelines On-Site Lab Training Environmental Lab/Analytical Lab Tour (CE 3334 lecture pending) (Lab preparation)	-Lab safety training
3	1/30-2/1	Experiment 1-Solids Experiment 2-Turbidity	
4	2/6-2/8	Experiment 3-Normality	-Report 1 (Solids and Turbidity)
5	2/13-2/15	Experiment 4-Alkalinity	
6	2/20-2/22	Experiment 5-Hardness	-Report 2 (Normality and Alkalinity)
7	2/27-3/1	Experiment 6-Jar Testing	-Report 3 (Hardness)
8	3/6-3/8	Experiment 6-Jar Testing (cont.) Lab Summary and Exam Discussion	
Break	3/13-3/15	Spring Break	
9	3/20-3/22	Midterm Exam	-Exam
10	3/27-3/29	Experiment 7-Ammonia nitrogen	-Report 4 (Jar Testing)
11	4/3-4/5	Experiment 8-DO	-Report 5 (Ammonia nitrogen)
12	4/10-4/12	Experiment 9-BOD Experiment 10-COD	-Report 6 (Dissolved oxygen)
13	4/17-4/19	Experiment 9-BOD (cont.) Experiment 10-COD (cont.)	
14	4/24-4/26	Study Experiment 11-Indicator Organisms, Analytical Lab Visiting, or Make-up Lab Lab Summary and Exam Discussion	-Report 7 (BOD and COD)
15	5/1-5/3	Final Exam	-Exam -Turning in lab notebook
Exam Week	-	-	

*As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. The lab schedule may also be changed or cancelled upon the availability of required instruments and their functionality failure.

**Section 001 on Tuesday, Section 002 on Wednesday, and Section 003 on Thursday.