

Course Syllabus - CE 5318, Fall 2013
(Section 001 (82196) and Section 002 (82197))
Physical-Chemical Processes I
MW 5:30 – 6:50; Nedderman Hall 202

Instructor: Hyeok Choi

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Office Telephone: 272-5116

Office Hours: Monday/Wednesday 14:00-16:00 or by appointment

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Faculty Profile: <https://www.uta.edu/mentis/public/#profile/profile/view/id/4042/category/1>

Personal Homepage: <https://www.uta.edu/faculty/hchoi>

Content: This course covers the basics of water quality modeling that will be used in subsequent environmental engineering courses and the physical processes used in water and air quality control including a discussion of the theory, design, and operation of physical unit processes.

Student Learning Outcomes:

- Ability to apply knowledge of mathematics, science, and engineering principles to understand and solve simple environmental engineering problems
- Ability to design and conduct experiments used in the environmental engineering field and to analyze and interpret the data from these types of experiments for the design and/or operation of an engineered system
- Ability to design several components of engineered systems and processes used in treating water, wastewater, and hazardous wastes

Requirements: CE 3334; CE 3131

Required Textbook: Wastewater Engineering, Metcalf and Eddy, Inc., McGraw-Hill, 2003.

Course Materials: Available at my MavSpace at

Ticket Link: https://mavspace.uta.edu/xythoswfs/webui/xy-4089090_1-t_YdBRFpXB

(Password will be provided soon.)

Modern Teaching Tools and Assistances

Power point presentations, course summary and handouts, video clips, lab visit, etc.

Major Assignments and Examinations: Homework assignments, one in-class mid-term exam, one take home mid-term exam, and one in-class final exam. Homework is due one week after it is assigned (usually on a Wednesday). Late homework will not be accepted without the consent of the instructor. Homework must be done using the typical engineering format of Given, Find, and Solution. Two general presentation formats are acceptable: 1) on engineering paper using pencil and very neat hand printing, or 2) printed output from a computer word processing and/or spread sheet program. In both cases the solution is given on one side only. Spreadsheet solutions must also have hand generated sample calculations. Graphs must be large enough to be easily read (typically half a page) and the axes must be clearly defined and labeled including units. Computer generated graphs should give the equation of the fitted line. Hand generated graphs must be done

on engineering paper with a straight edge. Your solutions must be presented linearly down the page so a reviewer can easily follow your solution. Every reasonable step in your solution must be presented. Solutions in which the solve function of a calculator is used are not acceptable. Answers must contain at least 2 but no more than 3 significant digits and appropriate units. Please write your answers, solutions and descriptions in a clear manner (i.e., it is not recommended to write in cursive letters). Your homework must be stapled in the upper left hand corner and your name and submitted date must be given on the first page.

Grading Policy: I reserve the right to vary slightly from the grade schedule listed below but it is highly unlikely the deviation will be more than 1 or 2 points up or down.

Homework (4 sets)	20%
Midterm Exam I	30%
Midterm Exam II	20%
Final Exam	30%
Total	100%

85.0 - 100%	A
75 - 85%	B
65 - 75%	C
55 - 65%	D
< 55%	F

Attendance Policy: Attendance is not mandatory; however, no special accommodations will be made for incomplete or missed assignments and exams due to unexcused absences.

Professional Code of Conduct: Students are expected to act in a manner consistent with a professional civil engineer. You are responsible for learning the material that makes up this course. I am responsible for helping you to learn it and determining if you have done so. Most people must do the assigned homework to learn the material of this course. My tests are designed to determine how much you have learned. To me, "learning" means understanding the material well-enough that 1) you can explain it to others so they can understand it and 2) solve problems you have not seen before. I welcome all pertinent questions in class and I am willing to spend many hours outside of class to help you learn. I also welcome any suggestions you have on how I can better help you to learn and/or determine if you have learned the material of this course. You are expected to attend every class and to show up on time.

Drop Policy: Please see university drop policy and deadlines.

Americans With Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 - The Rehabilitation Act of 1973 as amended. With the passage of federal legislation entitled *Americans with Disabilities Act (ADA)*, pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens. As a faculty member, I am required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing

authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at www.uta.edu/disability. Also, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364.

Academic Integrity: It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

"Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Series 50101, Section 2.2)

You may not copy any portion of another student's homework or the homework solutions from last year, including sharing spreadsheet formulas and output. You may discuss homework and solution techniques with a fellow classmate only after you have attempted to solve the problem. After the discussion you must work the problem by yourself.

Student Support Services Available: The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as "lecture," "seminar," or "laboratory" shall be 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 enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations is designated as Final Review Week. During this week, no new assignments will be given; however, previously assigned work may have a completion date during this week. In addition, no portion of the final examination shall be administered during the Final Review Week. Classes are held as scheduled during this week and materials covered in lectures during this week may be included in the final examination.

Librarian to Contact: Barbara Howser, Science and Technology Library.

E-Culture Policy: The University of Texas at Arlington has adopted the University email address as an official means of communication with students. Through the use of email, UT-Arlington is

able to provide students with relevant and timely information, designed to facilitate student success. In particular, important information concerning registration, financial aid, payment of bills, and graduation may be sent to students through email.

All students are assigned an email account and information about activating and using it is available at www.uta.edu/email. New students (first semester at UTA) are able to activate their email account 24 hours after registering for courses. There is no additional charge to students for using this account, and it remains active as long as a student is enrolled at UT-Arlington. Students are responsible for checking their email regularly.

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 6-9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Lab Safety Training: Not required for this course.

Make-up Exam Policy: No make-up exams are given except for medical or other similar hardships where advanced arrangements are made with the instructor; or in case of non-selective medical emergencies with appropriate physician's note or documentation. Other than circumstances described above, failure to take the exam at the scheduled time will constitute a grade of zero in the exam.

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

Office Hours: In addition to my posted office hours I am also available to meet with students most times when I am in my office and the door is open. However, the surest way to meet with me is to make an appointment by phone. I will normally be in my office during office hours, but if I do not have an appointment scheduled, I will not hesitate to leave my office during office hours to attend an important meeting.

Important: Prior to each class, the course materials including handouts and homework will be posted in my MavSpace. Visit the link and then click CE 5318 and CE 4351, which is open to students. You will need your NetID and corresponding password. Students need to check the MavSpace regularly before coming to class. The students also need to print out them and bring the materials (plus one chapter in advance) to the class. No hard copies for the course materials will be given to the students. I will try to send an email to students with updated information on course materials. However, it is students' responsibility to visit the MavSpace regularly and update course materials.

Copyright: All right reserved. No part of the course materials including handouts, homework, exams may be reproduced or transmitted in any form or by any means. The materials should be used for the class only and kept confidential. You cannot use them for any other purposes than the class. You cannot give them to anybody.

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 either the right or left hall way. 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 handicapped individuals. We will discuss in detail.

Other Useful Websites

Library Home Page	http://www.uta.edu/library
Subject Guides	http://libguides.uta.edu
Subject Librarians	http://www.uta.edu/library/help/subject-librarians.php
Database List.....	http://www.uta.edu/library/databases/index.php
Course Reserves.....	http://pulse.uta.edu/vwebv/enterCourseReserve.do
Library Catalog	http://discover.uta.edu/
E-Journals	http://liblink.uta.edu/UTALink/az
Library Tutorials	http://www.uta.edu/library/help/tutorials.php
Connecting from Off- Campus	http://libguides.uta.edu/offcampus
Ask A Librarian	http://ask.uta.edu

The following URL houses a page where we have gathered many commonly used resources needed by students in online courses: <http://www.uta.edu/library/services/distance.php>

Finally, the subject librarian for your area can work with you to build a customized course page to support your class if you wish. For examples, visit <http://libguides.uta.edu/os> and <http://libguides.uta.edu/pols2311fm> . If you have any questions, please feel free to contact the Coordinator for Information Services, Suzanne Beckett, at sbeckett@uta.edu or at 817.272.0923.

Tentative Schedule: 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.

Part I. Reaction Kinetics and Reactor Models (6-7 Weeks)

- Chapter 0. Overview, Differential Equation, Advection, and Diffusion
- Chapter 1. Stoichiometry, Reaction Kinetics, and Mechanisms
- Chapter 2. Mass Balance, Reactor and Flow Models
- Chapter 3. Non-ideal Flow Model and Combination of Reactors

Homework 1

Homework 2

In Class Midterm Exam

Homework 3

Part II. Mass Transfer Processes (4 Weeks)

- Chapter 4. Heterogeneous System, Rate Limiting Step, and Substrate Removal
- Chapter 5. Close System (Lake) Model, River Model, and Water Quality
- Chapter 6. Mixing and Flow Model

Part III. Case Studies (3-4 Weeks)

- Chapter 7. Flocculation, Settling, and Sedimentation/Floatation
- Chapter 8. Filtration
- Chapter 9. Basic Information on Gas Transfer and Sorption
- (Chapter 10. Gas Stripping)

Homework 4

Take Home Midterm Exam

Final Exam