

Course Syllabus

CE 6325 Spring 2014 (001-LEC (25794) and 002-LEC (23437))
Advanced Physical-Chemical Processes

Tuesday/Thursday 5:30 – 6:50 pm
Nedderman Hall 203

Instructor: Hyeok Choi

Office: Room 437, Nedderman Hall

Office Telephone: 272-5116

Office Hours: Monday and Thursday 13:00-16:00 pm or by appointment

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

Content: The course represents the fundamentals and applications of various advanced physical and chemical unit operations and processes for controlling drinking water quality. The course will cover i) general overview on the standard, regulations, and goals of drinking water quality, ii) general discussion on organic chemistry for environmental studies, and iii) detailed discussion of the theory, design, and operation of advanced physical and chemical unit processes which have not been discussed in the previous courses (CE 5318 and CE 5319, Physical-Chemical Processes I and II), including but not limited to, sorption, centrifugation, osmotic pressure, membrane separation, chemical oxidation and advanced oxidation, UV technology, and disinfection.

Student Learning Outcomes:

- Being familiar with water quality standards and regulations
- Having a capability of conducting experiments used for the design and operation of water treatment systems and analyzing and interpreting the data
- Applying and extending the theory of unit operations and processes to your area of interest in water quality control
- Extending students' knowledge to more advanced unit operations and processes for water quality control
- Designing several components of engineered systems and processes used for water treatment

Requirements: CE 5318 and CE 5319 (Those who have not taken the courses, please consult with Dr. Choi)

Required Textbook: 1) Water Quality and Treatment: A Handbook of Community Water Supplies, Fifth Edition, AWWA, McGraw-Hill, 1999.

References: Wastewater Engineering, Fourth Edition, Metcalf and Eddy, Inc., McGraw-Hill, 2003.

Course Materials: Course materials will be posted in my MavSpace prior to each class.

Link: https://mavspace.uta.edu/xythoswfs/webui/_xy-3718161_1-t_7kqsKrJw

Modern Teaching Tools and Assistances: Power point presentation, course handouts with many blanks, group discussion, etc.

Major Assignments and Examinations: One assignment, one in-class mid-term exams, one term paper and presentation, and one in-class final exam. Please write your answers, solutions and descriptions in a clear manner.

Grading Policy: I reserve the right to vary slightly from the grade schedule listed below.

Assignment (AOTs)	5%
Midterm Test	35%
Term Paper and Presentation	15%
Final Test	45%
Total	100%

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

Attendance Policy: Attendance is mandatory. No special accommodations will be made for incomplete or missed assignments and exams due to unexcused absences. You should come to class for exams and term-paper presentation.

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 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

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: 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://www.uta.edu/ses/fao>).

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: All students enrolled in this course 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.

Instructors may employ the Honor Code as they see fit in their courses, including (but not limited to) 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.

Although asking each other questions about homework assignments is allowed, direct copying is not allowed and will result in a 0 being given for the assignment. Asking each other questions, as well as direct copying, are prohibited on exams and will result in a 0 being given on the exam.

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 www.uta.edu/resources.

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.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete a 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>.

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.

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.

Important: Prior to each class, the course materials will be posted in my MavSpace. I will email students (via UTA email) with the location of the website. Students need to check the MavSpace regularly before coming to class. The students also need to print out them and bring the materials to the class. No hard copies for the course materials will be given to the students.

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 outside the classroom to the right. 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.

Librarian to Contact: Sylvia George-Williams, sylvia@uta.edu , Science & Engineering Library, Basement, Nedderman Hall.

Copyright Issue: 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 for any reasons.

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

Part I. Overview on Water Quality Control

- Chapter 1. Water Quality Standards, Regulations, and Goals
- Chapter 2. Health and Aesthetic Aspects of Water Quality
- Chapter 3. Guide to Selection of Water Treatment Processes
- Chapter 4. Source Water Quality Management

Part II. Advanced Unit Operations for Water Quality Control

- Chapter 5. Short overview on Conventional Unit Operations for Water Quality Control (Coagulation and Flocculation, Sedimentation, Filtration, Ion Exchange and Inorganic Adsorption, Chemical Precipitation (Water Softening))
- Chapter 6. Activated Carbon Adsorption
- Chapter 7. Centrifugation

Midterm Exam

- Chapter 8. Chemical Oxidation Processes
- Chapter 9. Advanced Oxidation Processes and UV-Based Oxidation Processes

Assignment

- Chapter 10. Membrane Separation Processes and Osmotic Pressure
- Chapter 11. Disinfection

Part III. Organic Chemistry for Environmental Studies (if time schedule is allowed)

- Chapter 12. Organic Chemistry

Term Paper and Presentation

Final Exam