ENVS 308 01E Water Quality

COURSE SYLLABUS: Spring 2025
Tue, Thurs 9:30a-10:45am
Campus: Main *Building:* STC *Room:* 136
INSTRUCTOR INFORMATION

Instructor: Dr. Naima Khan, PhD.
Office Location: Science Building (STC), 233
University Email Address: Naima.Khan@tamuc.edu

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Recommended: Title: Basic Environmental Technology – Water Supply, Waste management, and Pollution Control; 6th Edition
Year: 2015
Title status: Available
Imprint: Pearson. Author: Jerry A. Nathanson and Richard A. Schneider
ISBN: 0-13-284014-6
Software Required: MS Office
Optional Texts and/or Materials: Handouts and Academic worksheets

Course Description

ENVS 308 01E Water Quality: Design of engineered environmental systems for water and wastewater treatment in domestic or industrial applications. Topics include water chemistry; material balances; chemical, physical, and biological processes, theory of processes used to treat water and wastewater; applications of theory to design and operate treatment systems, including biological treatment, adsorption, coagulation, precipitation, decantation, filtration and disinfection.

Instructional Method: **The course is in class (face to face).**

Student Learning Outcomes

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1. After successfully completing this course the student will be able to learn and comprehend the fundamental principles of hydraulic pressure, water purification processes, water chemistry,

physicochemical and biological analyses of water, water distribution, advanced water treatment processes, and water reuse.
2. Acquire precise information for correct decision-making skills
3. Perform calculations to design and size water treatment facilities
4. Sketch and size the layout of water treatment processes
5. Calculate the dosage of chemicals for water treatment

1. **Critical Thinking:** Students will be able to differentiate between fact and opinion; be able to discern between relevant and irrelevant information, recognize bias in source material, and critically examine a diversity of source material.

2. **Communication:** In written, oral, and/or visual communication, students will communicate in a manner appropriate to audience and occasion, with an evident message and organizational structure.

3. **Teamwork**: Students will be able to work together toward a shared purpose relevant to the course or discipline with a sense of shared responsibility for meeting that purpose. Students must do their group study to develop a report for their preselected disaster. Students will learn how to work in a group, how to distribute workload among group members, and finally how to solve problems in a group. There will be equal group members for each group. In class, groups will work for 10 to 15 minutes to answer 1 or 2 questions. This way instructor will also be able to evaluate the teamwork performance for each group other than the quality of report and class presentations.

4. **Empirical and Quantitative Skills:** Students will be able to understand and utilize mathematical functions and empirical principles and processes.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Algebra, engineering math, basic chemistry.
In addition, using the learning management system, using Microsoft Word and PowerPoint, using presentation and graphics programs, etc.

Instructional Methods

Conducting lectures, resorting to videos and visual-aid presentations, e.g., “PowerPoint” and “You tube”, solving math problems together with the students in the classroom, expecting student participation in the classroom discussions, assigning Exams and homework assignments, etc.

Student Responsibilities or Tips for Success in the Course

Turn-in all the assigned academic work; actively participate in verbal discussions; take notes and copy written explanations during class periods; take assigned written Exams; log into the course website, regularly; complete the assigned weekly study.

Learning strategies

Lectures
Reading assignments to be discussed in class
Analysis of Case Study Samples
Individual work, analysis of free reading Homework

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Assumptions, Expectations, Philosophy

University students are a select group of students soon to be professionals.
Instructors can have high expectations of student performance.
Demanding courses benefit students more than easy courses.
Assignments are due on time unless you have made a prior arrangement with me (only granted for unusual or extenuating circumstances and in case of health issues proper medical excuse is required.

Come to class prepared, having read and thought about the assigned readings; course materials are meant to be studied, not merely read. Actively participate in class discussions; ask questions.

In university, a lot of your learning will occur outside of the classroom, during your own research, and in formal and informal interactions with your peers– both here and at meetings, correspondence, etc. Therefore, I expect you to take full advantage of ALL learning opportunities, including seminars and invited speakers.

Reading and assimilating information is a critical part of your current and continuing education. This will help you become a better writer, a more rounded individual, and expose you to subjects outside of your immediate knowledge.

GRADING

Final grades in this course will be based on the following scale:
A= 90%-100%; B = 80%-89%; C = 70%-79%; D = 60%-69%; F = 59% or Below

Tentative course outline

Date	Topics (Book Chapters)	Subtopics
Week 1	Introduction/Welcome	**Student and Faculty introduction** Basic Concepts: Water cycle and volume calculations Water properties, standards
Week 2-4	WATER CHEMISTRY: Elements, radicals, and compounds Chemical water analysis Hydrogen ion concentration and pH Chemical equilibria Chemical kinetics Gas solubility Alkalinity	
Feb 11 and 13	**Quiz-1** **Exam 1**	**(Exam and quiz will remain open until Feb 14)**
Week 5 - 8	WATER MICROBIOLOGY	Bacteria and fungi Viruses Algae Protozoa and multicellular animals Aquatic food chain Waterborne diseases Coliform bacteria as indicator organisms Tests for the coliform group

The *syllabus/schedule are subject to change.*

		Testing for enteric viruses Biochemical oxygen demand Biological treatment systems
March 10-14 **March 18th and 20th**	**Spring Break** **Quiz 2 & Exam 2** **(Exam and quiz will remain open until March 21st)**	
Week 9 - 12	WATER QUALITY and POLLUTION: Quality of surface waters Water quality in flowing waters Water quality in impounded waters Groundwater quality Water quality standards Organic compounds Organic matter in wastewater Microbiological quality of drinking water Chemical quality of drinking water PHREEQC model	
April 10th and 12th	Quiz 3	
Week 13-15	WATER DISTRIBUTION SYSTEMS and WATER TREATMENT PHREEQC model	Water quality and pressure requirements Municipal fire protection requirements Surface-water intakes Mixing and flocculation Sedimentation Flocculator-clarifiers Filtration Turbidity removal Taste and odor control Synthetic organic chemical removal Iron and manganese removal Precipitation Softening Fluoridation Chlorination Chlorination by-products Ozone Disinfection Ion exchange softening and nitrate removal. Removal of dissolved salts Sources of wastes in water treatment Dewatering and disposal of wastes from water treatment plants
Week 16	HYDRAULICS and HYDROLOGY PHREEQC model	Water pressure Pressure-velocity-head relationships Flow in pipes under pressure Centrifugal pump characteristics System characteristics Equivalent pipes Gravity flow in circular pipes Flow measurement in pipes, and open channels

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	WASTEWATER FLOWS, CHARACTERISTICS AND TREATMENT PHREEQC model	Amount of storm runoff Flow in streams and rivers Hydrology of lakes and reservoirs Groundwater hydrology Domestic wastewater Industrial wastewater
May 3-9 Final week	Exam 3 (final exam) will be on May 6th	

Exam:

There will be a total of 3 **exams** for the course. Exams will be designed to evaluate the student's understanding of the subjects covered in class and empirical and quantitative skills. Study guide will be given to help you prepare for exams.

Grades:

Quiz (10*3=30%)

3 Exams (20 % each x 3 = 60 %)

Class Attendance and Participation (10%)

Course Requirements and Evaluation Methods:

Attendance and punctuality are required and non-negotiable.
Homework, quizzes, exams, and term paper are required.
Activities that distract surrounding people are inconsiderate and disrespectful. Activities such as texting, emailing, browsing or using cellular phones are prohibited during Lecture.

We encourage student contribution to the overall progress of the group. We encourage interactive participation. It is necessary that students have a professional and ethical behavior through the entire course. Lectures are a group activity, and so it requires social consideration and respect amongst members of the group, teachers and professors.

Penalty enforcement (I reserve the right to adjust your grade for violation of the minimum expectations).

Make-up exams will only be given if arrangements are made with the instructor before missing the scheduled exam. A documented excuse will be required.
Otherwise, missing academic work will be counted as zeroes in the overall grade computation

COURSE AND UNIVERSITY PROCEDURES/POLICIES

NOTE #1: Late assignments are not accepted. Very, very extreme circumstances may or may not provide a warranted exception. This course moves very fast and there is not enough time to catch up. In case of extreme circumstances, I may accept late work. However, 10 points will be deducted from late assignments. Research Written Report and Oral Presentation: Each student will choose 1 type of treatment technology. The guidelines for the Written Report and Oral Presentation are in "D2L".

NOTE #2: Please email your presentation to the Professor, before your Presentation day.

NOTE #3: Missed Homework and Exams are not acceptable. Very, very extreme circumstances may or may not provide a warranted exception. This course moves very fast and there is not enough time to catch up. In case of extreme circumstances, I may accept let you take a missed Exam or submit a missed Homework. However, 20 points may be deducted from the missed Exam or from the missed Homework.

Overall Weighted Average Grade will be computed by adding the percentage of each grade earned from each assignment, as stated on the Course Grading table, shown above. **ONLY** unofficial grades will be posted on D2L. Official grades are in my grade book. It is most strongly recommended that each student retain their grades until the final grade has been entered into the university system to ensure all was recorded correctly.

TECHNOLOGY REQUIREMENTS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo. Below are technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_suppo rt.htm

YouSeeU Virtual Classroom Requirements: https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-SystemRequirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

Weekdays: 1-24 hours; Evenings, Weekends: 5-~48 hours

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.as px

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
https://www.britannica.com/topic/netiquette

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

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Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url: http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&MCommerce campuses. Report violations to the University Police Department at 903886-5868 or 9-1-1