CE4371 HYDROLOGY (SPRING 2024)

8:00 AM - 9:20 AM Tue & Thurs
Roy F. Mitte 5242

Instructor

Dr. Eunsang Cho, Assistant Professor of Civil Engineering
Ingram School of Engineering, Texas State University
Office: Ingram Hall 5311, Email: eunsang.cho@txstate.edu
*Graduate TA: Md Sayeed Faisal (faisal@txstate.edu)

Communication

Office hours are Tuesdays 9:30-11 pm and Thursdays 9:30-11 pm or by appointment. You are welcome to visit as often as you like!
Please email me if you have any questions. I respond to emails within 24 hours during the work week (I usually do not check email on weekends)

Prerequisites

CE4370: Hydraulics

Objectives

This course prepares you to:

1. have a broad understanding of the scientific principles governing hydrologic processes.
2. be able to apply hydrologic theory to several areas of engineering hydrology and design.
3. have knowledge of hydrologic models for watershed analysis.

Classes

Classes are used to introduce all course concepts and procedures
It is critical to attend, mentally engage, actively participate, and take notes (research has shown that taking notes increases retention)
Each class is associated with a module on Canvas
The module provides any handouts from the class

Readings

Readings are optional and supplement the material presented in class
The recommended (not required) textbooks:
Engineering Hydrology: An Introduction to Process, Analysis, and Modeling, Sharad K. Jain & Vijay P. Singh, McGraw Hill 2019
Applied Hydrology, Chow/Maidment/Mays, McGraw Hill 1988 (available online)
The reading for each class is identified in the associated module on Canvas

Homework

Course concepts and procedures are applied in the homework assignments Each assignment is posted on Canvas
Upload your submission to Canvas as a PDF file (File name: HW#Number_Firstname_Lastname)
Feel free to include handwritten work by taking photos or scanning
Your submission is due by 7:59 am on the due date (except weeks with midterms)
Late submissions are NOT accepted
Submissions must be entirely your own individual work, but discussion with others is

allowed
Show and explain your work so better feedback can be given during grading Solutions are posted on Canvas after each due date
Homework is graded within one week
The lowest homework grade will be dropped.

Quiz

A short quiz will be given about once every other week.
These quizzes will not be graded but successful completion will allow you to understand your weaknesses on the fundamentals.

Project (optional)

You will work in a team of approximately 2-3 students
Topics: data analytics for drought, climate change, groundwater etc.
Unique opportunity to develop your skills in data analytics, interpretation, and visualization using hydrologic data.
Can be submitted for extra credit (worth up to 25 points towards overall homework grade; overall HW grade can exceed 100%)
There are mid- and final presentations (Mar-5, Tue and Apr-25, Thurs).
The final presentation will be evaluated by Dr. Cho as well as peers.
Upload your final report to Canvas as a PDF file (by 7:59 am on Apr-30, Tue)

Exams

Firm exam dates are already set (see attached schedule or quizzes on Canvas)

- First mid-term: **Feb-22** (Thurs) / Second mid-term: **Apr-4** (Thurs)
- Final exam: 8:00 AM **May-2** (Thurs)

Make-up exams are only given for extreme cases
Notify me as soon as possible if you are unable to take a scheduled exam
Exams are based on the classes and homework
Final is comprehensive (roughly half from Modules before the 2nd mid-term and half from Modules after) Each exam has approximately 7 to 9 problems
First part of each exam has short conceptual problems (often from lectures); second part has quantitative problems (often similar to homework); third part has longer quantitative problems that deviate from common step-by-step methods (to ensure you understand the reasoning behind step-by-step methods)
Handouts with key figures and/or tables may be provided if needed
Bring a calculator (you cannot use a calculator on any device with communication capabilities)
One crib sheet is allowed for the midterms; two crib sheets are allowed for the final
Crib sheets are at most 3-inch x 5 inch index card; both sides of crib sheets can be used
You are NOT allowed to use any other information (notes, books, electronic devices, people, etc.) during exams
Submissions must be entirely your own individual work
Access to old exams or solutions is NOT allowed at any time
Exams are graded within one week

Grading

The following weighting is used to determine course grades:

10% - Attendance
20% - Homework
20% - Midterm 1
20% - Midterm 2
30% - Final

The following scale is used to determine course grades:
In general, A: 90-100, B: 80-89, C: 70-79, D: 60-69, and F: < 60

Homework assignments and project are graded by a grader, but please contact me if you have any concerns about the grading

Course Outline

The course is divided into a series of units as follows:

1. **Introduction to Hydrology** (Hydrologic Cycle, Conceptual Models, Budget Equations, Basic Concepts, Energy State of Water, Uniform Flow Equations)
2. **Land surface-Atmosphere Interaction** (Rainfall Formation, Measurement, Areal Estimation, Design Storms; Evapotranspiration)
3. **Statistical Methods** (Probability Distributions, Probability Applications, Risk and Reliability, Extreme Variables/Design Precipitation,)
4. **Groundwater/Infiltration** (Local and Watershed)
5. **Surface Water Runoff** (Hydrograph, Overland Flow, Design Flows)
6. **Flood Routing** (Unit Hydrograph, Rainfall-Discharge Models, Design Problems) and Hydrologic Design
7. **HEC-HMS models** and applications as time allows

* A Unit Handout will be distributed on Canvas. The handout will include a list of unit topics, assigned readings, quiz dates, and problem set assignments.

Notifications

This course adheres to the TXST academic integrity policy as stated in the General Catalog and the Student Conduct Code

Instructors are required by law to notify university officials about any disclosures of interpersonal violence

It is a violation of academic integrity and/or copyright laws to share, post, republish, or repurpose any course materials. All materials are provided only for your personal use.

Resources (see Canvas syllabus for hyperlinks)

Any student who self-identifies with the Student Disability Center (SDC) as having a disability is eligible for support from the SDC

Any student seeking an exemption from attending class or meeting a deadline for a religious observance should submit the Religious Accommodation Request Form to the Division of Student Affairs