The University of Texas at Tyler
Department of Civil Engineering

CENG 3361: Applied Engineering Hydrology and Hydraulic Design

Course Syllabus (Spring 2022)

Date: January 10, 2022. Updated: January 24, 2022.

Time & Venue	Lecture Times: MoWe, 1:25 p.m. – 2:20 p.m., HEC C204 Lab 031L Time: Mo, 2:30 p.m. – 5:15 p.m., HEC D114 Lab 032L Time: We, 2:30 p.m. – 5:15 p.m., HEC D114
Instructor	Dr. Shariful Huq Office: HEC A204 Email: shuq@uttyler.edu Phone: (903) 566-6701 Office hours: MoWe 9:30 a.m. – 12:00 p.m. or By Appointment
Teaching Assistant	Name: TBA Email: …@patriots.uttyler.edu
Note to Student about a Syllabus	This syllabus is a statement of intent about how the course will be taught this semester. It outlines what we will cover, what you will need to do in the course, and it explains what and when you must do it to successfully complete the course and get a great final grade. This syllabus is intended to protect you from arbitrary or untimely changes in course requirements and due dates. But I reserve the right to make changes as necessary to the syllabus with announcement of changes. As we learned during 2020, there are many circumstances outside of our direct course control that may require changes to this syllabus in content and schedule. These will always be announced in advance and the syllabus will be updated on Canvas so all can be aware of the required changes.
Course Website	See UT Tyler's Canvas Website

Course Objective	Welcome to CENG 3361 (Applied Engineering Hydrology and Hydraulic Design). During the upcoming semester, I believe you will find our study of hydrology and hydraulic design to be interesting, challenging, and rewarding. In this course, we will cover topics such as precipitation, hydrograph analysis, evapotranspiration, runoff, flood routing, open channel flow and design of stable channels, and hydraulic design. A project involving hydrologic system analysis and design will be assigned.
Prerequisite/Corequisite	1. CENG 3310 Fluid Mechanics and Hydraulics
Required Text	No required textbook. The recommended textbook used for this class is: ○ Hydrology and Hydraulic Systems, 4th Edition by Ram Gupta, Waveland Press, Inc. ISBN 1-4786-3091-4
Grading	Contributions towards final grade (out of 100%) 5% Professional Practice (Attendance/3 ASCE Meetings) 15% Exam 1 15% Exam 2 25% Final Examination 15% Homework 15% Lab 10% Project

	In grading the homework, assignments, tests, exams, etc., **no credit will be given to methods not covered in this class**, although these methods, tables, formulae may appear in the textbook. Errors or outdated material in the textbook should not be the reason for claiming full credit on work done. Letter grades will be assigned based on the final course grade: A 90 and above B 80 to 89.99 C 70 to 79.99 D 60 to 69.99 F below 60 No letter grade will be released until it is official on PeopleSoft. In consistency with the College of Engineering's policy, **a student who does not score 50% or more** of the total points allocated to the **Final Examination may receive** an **F** grade.

Attendance	For attendance during class meetings, towards the end of the meeting students will be called by names, and marked absent if not in attendance. To protect your confidentiality, graded homework, assignments, and exams will not be placed at open area for collection. They will only be distributed by the instructor during class or office hours. Graded homework, assignments, and exams not collected after the final exam week will be disposed according to UT Tyler policy.
Exams	Exams are given during the class times. The dates of the Exams will be announced in class at least one week in advance to exam date.
Final Exam	**The Final Exam is TBA (by University Admin.)** All material covered in the course will be tested.
General Exam Rules & Cheat Sheet	All exams are closed book. You are only allowed to bring your writing instruments (pencils & pens), erasers, and NCEES approved calculators. Topics to be tested will be announced in class and on Canvas one week prior to the exam. The instructor will set questions from material taught in class. The meaning of "taught in class" includes verbal instructions or written notes on the white board and Canvas, briefing / presentation during field trips, observation during field work / experiments. They do not necessarily appear in the textbook, distributed class notes, or homework. It is very important that you attend the class activities and take additional notes. To discourage students from focusing narrowly on only a few questions, **no practice exam will be given**. There are enough self-practice problems as well as in the textbook at the end of each chapter, which are not required as part of each homework assignment.

Calculators	In line with the Civil Engineering Department's policy, only calculators permitted by NCEES for use in the current semester's FE exam are permitted to be used in the CENG 3361 examinations. No other model of calculator will be allowed. Models previously allowed by NCEES in the past but are no longer valid for the current FE exam are prohibited in the CENG 3361 exams. Please check www.ncees.org for the latest permitted calculator models. **It is the student's responsibility** to check the validity of his/her calculator model, purchase, and be familiar with the functions of the permitted calculators prior to the exam. If an unapproved calculator is found during any exam, it will be taken away immediately and only be returned to the student after the exam.

Field Trip	To be announced/decided.
Design Project	The design project consists of a drainage study in Tyler. Each group will present their findings and recommendations at the dates shown in the course schedule.
Homework	10 homework assignments is comprised of about 40 homework problems out of the textbook. The homework problems will be assigned at the completion of a topic and will be due for online submission via canvas on the day stated in the homework sheet and course schedule. Only selected homework problems will be graded. All homework solutions **must** be submitted on engineering paper (you can buy them at Office Depot, or online). In all your homework and exam solutions, you are expected to present, in written form, the formulae used, the values off the parameters, intermediate calculations, final answers, and their units. Draw a box around your final answer. Not having any of the above will lead to points being deducted. Do not expect all the homework problems be similar to the examples covered during class time. In some cases, you are expected to read additional examples in the textbook or think of the solution yourself or discuss with your classmates.
Late Homework/ Assignment Policy	Absolutely **NO** late homework will be accepted. If homework is not submitted on canvas by the due date, you will receive a zero for the assignment. No exceptions. Homework solutions are usually posted on Canvas two days after the due date.

Lab	All lab solutions **must** be submitted on engineering paper (you can buy them at Office Depot, or online). In all your lab solutions, you are expected to present, in written form, the formulae used, and the values off the parameters, intermediate calculations, final answers, and their units. Draw a box around your final answer. Not having any of the above will lead to points being deducted.

Re-schedule of Examination	There is **no make-up or rescheduling of the Final Examination**. Make-up for the Exams (Exam1 & Exam2) will only be arranged if you inform the instructor **prior** to or on the day **before** the exam, with a strong valid reason. Examples of strong valid reasons are official UT Tyler travel, accident, illness, child-birth, passing of an immediate family member, jury duty, or court appearance. These are not expected and cannot be rescheduled. You will be required to show documentary evidence for the valid reason (e.g., doctor's letter, police report, court letter). Events that can be pre-scheduled or rescheduled are not considered valid reasons. Examples of non-valid reasons are traffic, wedding, driving test, sending car for service, clash with another course schedule, etc. Job interviews will be considered on a case-by-case basis (again, with documentary evidence). If an emergency happens during the exam day, you should contact the instructor at the earliest possible time (or call the HEC Engineering office, or contact one of your classmates or TA who will then inform the instructor). Any make-up exam will be given on the Dead Day. Each student is only allowed one (1) make-up exam. That is, he/she can only make-up Exam 1 or Exam 2, but not both. To compensate for the fact that you may apply what you learn in the entire course when answering make-up Exams 1 or 2, **the make-up exam will be more difficult than the original exam**. Students who fail to show up for the make-up or final exam with an invalid reason will be given 0 points for that exam; or for a valid reason an incomplete "I" grade. He/she must take the exam the next time this course is being offered to have the "I" grade change to a letter grade. All the assessment components and marks will be retained for the calculation of the final letter grade. The letter grade will be benchmarked against the same class for the semester in which the exam had been missed.

Collaboration/ Cheating	Cheating is unethical and not acceptable. Plagiarism is using information or original wording in a paper without giving credit to the source of that information or wording: it is also not acceptable. Do not submit work under your name that you did not do yourself. You may not submit work for this class that you did for another class. If you are found to be cheating or plagiarizing, you will be subject to disciplinary action, per UT Tyler catalog policy.

Audio/Video Recording	Recording of class instructions by any phone, audio or video device is not permitted. The only exception is at the request of Student Accessibility and Resources, or at the request of Department, College, or University for teaching evaluation.
iPhone/iPod/iPad, Laptop, etc.	Please turn off your iPod/iPad and Laptop during class time. Also turn off your cell phone or switch it to silent mode during class time. If you need to answer a phone call, please leave the class quietly and only answer outside the class door. You are not allowed to answer any phone calls during the examination.
Disability	In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA), and the ADA Amendments Act (ADAAA), the University of Tyler at Texas offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including non-visible a diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://hood.accessiblelearning.com/UTTyler and fill out the New Student application. The **Student Accessibility and Resources** (SAR) office will contact you when your application has been submitted and an appointment with an Accessibility Case Manager. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.
Important Covid-19 Information for Classrooms and Laboratories	Students are required to wear face masks covering their nose and mouth, and follow social distancing guidelines, at all times in public settings (including classrooms and laboratories), as specified by COVID-19 Information and Procedures. The UT Tyler community of Patriots views adoption of these practices consistent with its Honor Code and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff. Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher-than-normal temperature will be excused from class and should stay at home and may join the class remotely, if a zoom option is available. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

Recording of Class Sessions	Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

Tentative Schedule

Lsn	Date	Topic	Text	HW Assigned	HW Due
1	1/10	Course Introduction			
2	1/12	Hydrologic Cycle and Budget	2.1 - 2.4		
	1/17	No Class (MLK Day)			
3	1/19	Probability and Statistics in Hydrology	11	HW 1	
4	1/24	Precipitation (Census Day)	2.5 - 2.7		
5	1/26	Precipitation (IDF)	2.8	HW 2	HW 1
6	1/31	Evaporation and Transpiration	3		
7	2/2	Evaporation and Transpiration	3	HW 3	HW 2
8	2/7	Infiltration and NRCS Curve Number	4		
9	2/9	Infiltration and NRCS Curve Number	4	HW 4	HW 3
10	2/14	Runoff	9.1 - 9.2		
11	2/16	Rational Method	16.10	HW 5	HW 4
	2/21	**Exam I**			
12	2/23	Hydrographs	9.5 – 9.7		
13	2/28	Unit Hydrographs	9.8 – 9.9	HW 6	HW 5
14	3/2	Surface Water Flow Measurements	8		
	3/7	No Class (Spring Break)			
	3/9	No Class (Spring Break)			
15	3/14	Stream Flow Measurements	8		
16	3/16	Introduction to Hydraulic Structures	Handout	HW 7	HW 6
17	3/21	Open Channel Flow	14		

18	3/23	Open Channel Flow	14	HW 8	HW 7
19	3/28	Weirs	13.1 – 13.5		
20	3/30	Weirs	13.1 – 13.5	HW 9	HW 8
	4/4	**Exam II**			
21	4/6	Spillways	13.12 – 13.18		
22	4/11	Energy Dissipators	Handout		
23	4/13	Culverts	17.7	HW10	HW9, Project
24	4/18	Project Presentations			
25	4/20	Project Presentations			HW10
	4/26 ~ 4/30	**Final Exam**			

Tentative Lab Schedule

Lab	Monday Lab Date	Wednesday Lab Date	Topic	Lab Due
-	1/10	1/12	No Lab Meeting (First Week)	-
1	1/17	1/19	MLK-day: No Lab Meeting Hydrologic Cycle as a Mass Balance (For both lab sections)	-
2	1/24	1/26	Probability and Statistics	Lab 1
3	1/31	2/2	Areal Rainfall and Thiessen Method	Lab 2
4	2/7	2/9	Infiltration	Lab 3
	2/14	2/16	Exam I Review	Lab 4
5	2/21	2/23	Stormwater Runoff	

6	2/28	3/2	Hydrographs	Lab 5
	3/7	3/9	No Lab Meeting (Spring Break)	
7	3/14	3/16	Watershed Delineation & Design Project	Lab 6
	3/21	3/23	Design Project Progress Meeting	Lab 7
	3/28	3/30	Exam II Review	
8	4/4	4/6	Open Channel Flow, Weirs, Spillways	
	4/11	4/13	Design Project Progress Meeting	Lab 8
	4/18	4/20	Final Exam Review	

Desired Learning Outcomes

In this course, you will learn to:

1. Describe the hydrologic cycle; recognize the various storage and transport pathways in the cycle.

2. Predict runoff from a storm using constant (ϕ-index) loss and variable (SCS Method) loss infiltration methods.

3. Predict runoff from a storm using unit hydrograph methods.

4. Obtain historical flood data using the Internet.

5. Apply flood frequency analysis; use probability concepts and frequency distributions to evaluate flood data.

6. Describe the hydrologic design scale; select a design storm, specifying precipitation depth and distribution.

7. Compute normal depth in a channel.

8. Design an open channel.

9. Analyze open channel structures such as weirs and spillways.

10. Use the rational method to compute the peak discharge for an urbanized watershed.

11. Use spreadsheets and math problem solving tools to perform the mathematical operations required in hydrological and hydraulic analysis and design.