University of Texas at Tyler - Department of Civil Engineering
Summer 2025 – Session II (July 07 – Aug 09)
Course Syllabus

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1. **Course number and name**
   CENG 3310-Fluid Mechanics and Hydraulics

2. **Credits, contact hours**
   - 3.0 Credit Hours (ES=2.5, ED=0.5)
   - Lecture time and Venue: Fully online asynchronous (Canvas)
   - LABS: None
   - This is an engineering topics course that focuses on introducing fluid mechanics and how fluids behavior in various conditions.

3. **Instructor's or course coordinator's names**
   - Dr. Zain Al Houri
   - Email: zalhouri@uttyler.edu

4. **Textbook, title, author, and year**
   - Any fluid mechanics textbook
   - Recommended Text (the one in which I reference in class): Munson, Bruce R., Donald F. Young, Theodore H. Okiishi, Philip M. Gerhart, Andrew L. Gerhart, and John I. Hochstein. 2021. **Fundamentals of Fluid Mechanics. 9th ed**. Wiley Publishing, ISBN: 9781119598114

5. **Specific course information**
   a) Catalogue Description: Basic concepts of fluid, and the fundamentals and applications of ideal and real fluid flow. Topics include fluid statics, conservation principles, the Bernoulli equation, fluid flow in pipes, linear momentum, drag, similitude, fluid flow measurement devices, and open channel flow.

   b) Requisite and Co-requisite: ENGR 2302: Dynamics, MATH 3305: Differential Equations, MATH 3404: Multivariate Calculus (co-requisite)

   c) Required course

6. **Specific goals for the course**
   1. Determine pressures and forces on submerged bodies.
   2. Analyze flow rates, velocities, energy losses, and momentum for fluid systems.
   3. Apply the laws of conservation of mass, momentum, and energy to static fluids and general fluid flow in conduits or open channels.
   4. Analyze fluid flow in pipeline components.

7. **Topics covered**
   - Fluid Properties
   - Hydrostatic pressure and hydrostatic forces on planar and curved surfaces
   - Conservation of mass, energy and momentum
   - Similitude
   - Drag
   - Open channel flow (e.g. subcritical vs. supercritical flow, specific energy, Manning equation)
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8. Student Learning Outcomes

At the completion of the program, students should be able to	
SO 1	Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
SO 2	Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
SO 3	Communicate effectively with a range of audiences
SO 4	Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
SO 5	Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
SO 6	Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
SO 7	Acquire and apply new knowledge as needed, using appropriate learning strategies

9. Mapping Course to Student Learning Outcomes

The learning outcomes of this course contribute to meeting one or more of the student learning outcomes as shown below, with the contribution designated as "H-high", "M-medium", or "L-low":

	SO 1	**SO 2**	**SO 3**	**SO 4**	**SO 5**	**SO 6**	**SO7**
CLO 1	**H**	**M**	**L**	**L**	**-**	**M**	**M**
CLO 2	**H**	**H**	**L**	**L**	**-**	**M**	**M**
CLO 3	**H**	**H**	**L**	**L**	**-**	**M**	**M**
CLO 4	**H**	**H**	**L**	**L**	**-**	**M**	**M**

CENG 3310-460 Fluid Mechanics and Hydraulic
Course Policies & Student Responsibilities

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LECTURE TIME AND VENUE

Fully online asynchronous (Canvas)

OFFICE HOURS

by appointment via Zoom (email to schedule)

Virtual office hour-Zoom Link
https://uttyler.zoom.us/j/89375718409?pwd=PI1CcbPPniBbsGGIj5yBgUPFqfVLZK.1
Meeting ID: 893 7571 8409
Passcode: 186890

CONTACT

The best method of contact is either **to send me email through Canvas** or from your Patriots account. Any email you send should have your first and last name, your course and section number (e.g., Houri CENG 3310), and proper punctuation. Failure to do so may delay the response

COURSE WEBSITE

Canvas will be used to manage the course material for the semester. All course materials and announcements will be provided in Canvas. There you will find homework assignments, homework solutions, handouts and other material pertaining to the class. **Please check there regularly.**

***Sharing of course materials*:** Course material delivered via Canvas, may NOT be shared online or with anyone outside of the class, without me granting express written permission. The term handouts refer to all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, assignment sheets, recorded lectures, outlines, in-class materials, and review sheets. The unauthorized sharing of class materials outside of the class constitutes academic dishonesty and disciplinary action may be taken (see Policy on Academic Dishonesty below).

GRADING BREAKDOWN

The following components contribute to your final grade:

Assessment Component	Weight
Homeworks	10%
Professional Practice	15%
Watch and Work Tasks/Discussions	10%
Midterm Exams (2)	40%
Final Exam	25%

Final Grade: Scale
90-100: A
80-89: B
70-79: C
60-69: D
<60: F

If necessary, I reserve the right to adjust the grade scale at the end of the semester to your benefit. If you earn less than 65% on all Exams or if you fail to earn at least 50% in the Final you may fail the course, **regardless of your course grade**.

**NOTE: There will be no makeup work or extra credit allowed/granted at the end of or during the semester unless allowed/granted to everyone by the instructor. All assignments must be turned in at the appropriate time to receive credit.
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EXAMS:

There will be 2 midterm examinations and one final examination. The exams are **TENITATIVELY** scheduled for:

Exam 1: F, July 18th
Exam 2: F, Aug 1st
Final Exam: As published by the University.

- Exams dates may be moved up or pushed back depending on the progress of the lectures. Exams are closed book. You can use a calculator and instructor approved reference material. *Solutions to exams will NOT be posted on Canvas*. No make-up exams will be given except for medical orother 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 the circumstances described above, failure to take the exam at the scheduled time will constitute a grade of zero in the exam.
- **You will need access to a printer to print the exam. You will also need to print a copy of the FE packet that you will use on all exams. All exams will be held online and proctored through zoom. Everyone will be required to log into Zoom and have a camera on throughout the duration of the exam. failure to do so will result in a grade of a zero on that exam.**
- *I do not return the exam papers, but you may request a virtual meeting to review your exam*

PROFESSIONAL PRACTICE

Your professional practice grade will be 15% of your overall grade in this course. Professional practice this summer will entail watching 3 videos that have been posted to canvas and providing a short writeup for each video using the template provided on canvas. While the discussion points in these videos are not technical in nature, the content covered will help provide you some insight into non-technical areas that are just as important. At UT Tyler, our goal is to not only to make sure you have the strong technical skills to be successful in your career but also many of the non-technical, but just as important, skills. This professional practice grade is to give you some of the non-technical skills that will hopefully make you successful.

WATCH AND WORK TASKS/DISCUSSIONS

This component includes short tasks assigned after lecture videos to help reinforce learning and encourage active engagement. Activities may include individual reflections, quick response tasks, or participation in Canvas discussions related to the lecture content. These assignments are typically brief but important for staying connected with the material. Timely and thoughtful participation will contribute 10% to your final course grade.

HOMEWORK

Homework will be assigned on a regular basis. Homework is due on the date outlined on canvas. **You will need to upload your homework as a single pdf file to canvas no later than 5 pm on the date it is due**. No late homework will be accepted except for unusual circumstances. Homework will not be graded in the traditional sense. You will find that all homework solutions are posted on Canvas so you will be able to check your own work before submitting the assignment. You will be given full credit for submitting your homework on time and following the correct homework format. Homework that is not submitted following the homework guidelines will receive a 0. **Homework must be submitted on engineering paper. Homework solutions not submitted on engineering paper will receive only 90% of the graded credit**. Solutions should be presented in a clear methodical manner. Follow the "homework submission guidelines" when completing your assignment. Solutions which are not clearly presented will NOT receive credit.

HOMEWORK SUBMISSION GUIDELINES (PROFESSIONALISM REQUIREMENTS)

1. Homework should be submitted using letter size (8 ½ x 11") paper. Engineering paper is required.
2. The header of the first page should include the following:
    a. Name of Student
    b. Student Number
    c. Course Number and Name
    d. Homework Number
3. There should be no more than 2 problems per page. This is to ensure that there is enough spaceon the paper for the grader to add comments.
4. The submitted homework **should be uploaded as one pdf file** NOT as several images.
5. All problems should include:
    a. Problem Number
    b. A diagram of the problem (draw all free body diagrams when necessary)
    c. A set of given quantities
    d. A set of unknown quantities
    e. A set of assumptions
6. All numbers and writing should be clear and readable.
7. When required to produce a graph, use a computer program such as excel or MATLAB to generatethe plot. Do not draw it by hand!
8. The **final answer should be boxed** and at the end of the solution.

LAPTOPS/PDAS/MP3 PLAYERS/CELL PHONES OR OTHER ELECTRONIC DEVICES

The use of any electronic device, except an approved calculator, is not permitted during exams. Your exam will be collected, and your grade will be a zero if you are caught using a non-approved electronic device/calculator. Any instances of a calculator inappropriately used during an exam will be the basis of alleging Academic Misconduct and may result in Failing (F) of the course at the determination of the course's instructor or the basis for a recommendation for expulsion from the University. Any Calculator used during an exam in this course must meet the requirements stated within the policy below.

CALCULATOR POLICY

Only NCEES approved calculators will be permitted during tests and your test will be collected and your grade will be a zero if you are using a non-approved calculator.

The approved calculators include the following: (Please check the NCEES website for a complete listing, www.ncees.org/exams/calculator-policy/. Examples include but are not limited to:

- Hewlett Packard – HP 33s, HP 35s, and no others
- Casio – All FX 115 models
- Texas Instruments – All TI 30X or TI-36X models.
- If you are unsure about your calculator, it is your responsibility to check for approval.

At any time during the exam your calculator is subject to a randomsearch by the instructor. Failure or refusal to clear all memory or to surrender your calculator to search will disqualify you from the exam immediately, unless you can produce a calculator meeting the requirements as stated above.

TENTATIVE COURSE SCHEDULE

The following schedule may be adjusted, as needed, during the semester to better serve the educational needs of the class. Any modifications to the schedule will be posted in the Canvas Announcements

Lesson No.	Date	Topic	Lesson Material
		Week 1 (July 7 - July 11)	
1	7-Jul	Course Introduction, Fluid Properties: measures of fluid mass & weight)	1.1-1.4
2	8-Jul	Fluid Properties: Ideal Gas Law, Viscosity	1.5-1.6
3	9-Jul	Fluid Properties: Compressibility, Vapor Pressure and Surface Tension	1.7-1.9
4	10-Jul	Hydrostatic Pressure derivation and Examples	2.1-2.3, 2.3.1
	10-Jul	CENSUS DATE	-
5	11-Jul	Barometers, Manometers (Piezometers and U-Tube Manometers)	2.4-2.6
		Week 2 (July 14 - July 18)	
6	14-Jul	Pressure Distribution, Hydrostatic forces on plane surfaces	2.8-2.9
7	15-Jul	Hydrostatic forces on curved surfaces	2.10
8	16-Jul	Buoyancy and Stability	2.11
9	17-Jul	Conservation of Mass, Continuity Equation	5.1
10	18-Jul	Bernoulli's Equation	3.1-3.4
	18-Jul	**EXAM 1 (9:00 am - 10:15 am CST on Zoom)**	
		Week 3 (July 21 - July 25)	
11	21-Jul	Energy Equation, Hydraulic Grade Lines and Energy Lines	3.3-3.7
12	22-Jul	Laminar Flow in Pipes	8.1-8.2
13	23-Jul	Turbulent Flow Pipes	8.4
14	24-Jul	Turbulent flow pipes, conduit flow, minor losses	8.4.2 and 8.4.3
15	25-Jul	Minor Losses, Pipe flow problems Iteration to solve V, Q, and D	8.4.2, 8.4.3, 8.5.2
		Week 4 (July 28 - August 01)	
16	28-Jul	3 Reservoirs Problem	8.5.2
17	29-Jul	Calculating pump head, Pitot tubes	5.3.3, 3.5
	29-Jul	LAST DAY TO WITHDRAW FROM ONE OR MORE COURSES	
18	30-Jul	Hazen-Williams Equation, Pipes in Parallel	8.5.2
19	31-Jul	Flow meters, Momentum (Intro)	8.6, 5.2
20	1-Aug	Momentum	5.2
	1-Aug	**EXAM 2 (9:00 am - 10:15 am CST on Zoom)**	
		Week 5 (August 4 - August 9)	
21	4-Aug	Dimensional Analysis	7.1-7.3, 7.5-7.8
22	5-Aug	Similitude	7.10
23	6-Aug	Drag and Lift	9.3-9.4
24	7-Aug	General open channel flow, surface waves	10.1-10.2
25	8-Aug	General open channel flow, surface waves	10.1-10.2
	9-Aug	**FINAL EXAM (9:00 am - 10:15 am CST on Zoom) -Covers all lessons**	

FINAL DAY TO WITHDRAW

The last day to withdraw from one or more courses is **July 29th.**

CENSUS DATES

The university requires that instructors report the attendance to the register at various points in the semester. Therefore, on **July 10th**, I will report on the attendance for the class.

CHAT GPT OR OTHER AI SOURCES

Under no circumstances is a student allowed to use any AI-based writing program to generate answers to exams, quizzes, assignments, homework, or any other graded assignment in this course. Any use of AI will be considered cheating according to the Academic Dishonesty policy above.

ACADEMIC MISCONDUCT

Plagiarism of homework and cheating on examinations will be interpreted as academic misconduct and will not be tolerated. Please refer to the University of Texas at Tyler current Undergraduate Catalog for academic policies and Manual of Policies and Procedures for Student Affairs (MOPPS, Chapter 8) regarding academic integrity, cheating and plagiarism. Academic dishonesty will not be tolerated. Ignorance of the rules and policies provides no protection from the consequences.

TECHNICAL SUPPORT

For technical problems with Canvas, contact UT Tyler 24/7 Canvas Support, which can be accessed by clicking Help at the bottom of the Global Navigation menu on the far-left side of the browser window. For login/password problems or support for other technical issues, contact Campus Computing Services at 903-565-5555 or itsupport@uttyler.edu.

UNIVERSITY POLICIES

(From the *Handbook of Operating Procedures* and the UT Tyler Website)

UT TYLER HONOR CODE

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

STUDENT RIGHTS AND RESPONSIBILITIES

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsiblities.php

CAMPUS CARRY

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at http://www.uttyler.edu/about/campus carry/index.php

UT TYLER A TOBACCO-FREE UNIVERSITY

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

GRADE REPLACEMENT/FORGIVENESS

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at http://www.uttyler.edu/registrar. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of

the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract. The Census Date is the deadline for many forms and enrollment actions that students need to be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit,
- Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

STATE-MANDATED COURSE DROP POLICY

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

DISABILITY SERVICES

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 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. 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.

STUDENT ABSENCE DUE TO RELIGIOUS OBSERVANCE

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second-class meeting of the semester.

STUDENT ABSENCE FOR UNIVERSITY-SPONSORED EVENTS AND ACTIVITIES

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

SOCIAL SECURITY AND FERPA STATEMENT

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

EMERGENCY EXITS AND EVACUATION

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by the University Police, Fire department, or Fire Prevention Services.

STUDENT STANDARDS OF ACADEMIC CONDUCT

Disciplinary proceedings may be initiated against any student who engages in scholarly dishonesty, including but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or part to another person, taking an examination for another person, any act designed to give an unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

a. Copying from another student's test paper;
b. using, during a test, materials not authorized by the person giving the test;
c. Failure to comply with instructions given by the person administering the test;
d. Possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have specifically been prohibited by the person administering the test;
e. Using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
f. Discussing the contents of an examination with another student who will take the examination;
g. Divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructor has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
h. Substituting for another person, or permitting another person to substitute for oneself to take a course, test, or any course-related assignment;
i. Paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, homework solution, or computer program;
j. Falsifying research data, laboratory reports, and/or other academic work offered for credit;
k. Taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonable should know that an unfair academic advantage would be gained by such conduct; and
l. Misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by an means another's work and the submission of it as one's own academic work offered for credit.

iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on academic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

UT TYLER RESOURCES FOR STUDENTS

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)