

ce-3105-syllabus-2022-3

February 1, 2023

1 CE 3105 Mechanics of Fluids Laboratory

1.1 Course Catalog Description:

- (1) Mechanics of Fluids Laboratory. Prerequisite: CE 3305. Experimental studies of fluid behavior.

1.2 Prerequisites:

CE 3305 or equivalent

1.3 Course Sections

Lesson time, days, and location:

1. Section 301; CRN 33373; 1300-1550 F ; CE 007
2. Section 302; CRN 24888; 1300-1550 W ; CE 007
3. Section 303; CRN 33376; 1300-1550 M ; CE 007
4. Section 304; CRN 24889; 0900-1150 W ; CE 007

1.4 Course Instructor:

Instructor: Theodore G. Cleveland, Ph.D., P.E., M. ASCE, F. EWRI

Email: theodore.cleveland@ttu.edu (put CE 3105 in subject line for email related to this class)

Office location: CECE 203F

Office hours: TBD

1.5 Teaching Assistant:

Teaching Assistant(s):

1. Lorena Albuquerque Zananreis email: lzanandr@ttu.edu (put CE 3105 in subject line for email related to this class) Office location: TBD Office hours: TBD
2. Lei Lu email: Lei.Lu@ttu.edu (put CE 3105 in subject line for email related to this class) Office location: TBD Office hours: TBD
- 3.

1.6 Textbook(s):

[Instructor Notes](#) are available and will serve as the textbook.

[Supplimental Readings](#) if any, are stored on the class server.

1.7 Course Objectives:

Draw the student's attention the behavior of real fluids and to expose students to the experimental method. The class will also improve technical writing skills and prepare students for the fluid mechanics section of the FE Exam. This course emphasizes collaboration through group work, and as such, a portion of the course grade will be based upon peer assessment.

1.8 Knowledge, Skills, Abilities (KSA) :

During this course the student will 1. Use measured and tabulated fluid properties with correct units to solve fluid problems. 2. Solve manometer problems through application of fundamental equation of fluid statics. 3. Determine the pressures, and forces and their line of action, for a fluid at rest on plane and curved surfaces. 4. Identify a control volume. 5. Be able to apply the conservation of mass principle to a control volume. 6. Be able to apply the conservation of energy principle to a control volume. 7. Be able to apply the conservation of momentum principle to a control volume. 8. Solve channel transitions (width/bed level changes) in open channel flow problems. 9. Observe the difference between the behavior of a real and a theoretical fluid.

1.9 ABET Student Outcomes

- Engineering:
 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
 2. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

1.10 Resources/Tools

Computational tools equivalent to those used in ENGR 1330 are expected. Professional software is used in the course; these are downloaded from the original sources (USGS and COE)

1.10.1 Hardware Requirements

The college of engineering has specific laptop requirements for courses that are listed at <https://www.depts.ttu.edu/coe/dean/engineeringitservices/buyingtherightcomputer.php>

A minimal AWS Lightsail Instance (use Windows Server 2000 template; lowest resource provision tier; AWS RDP client, or download and install own RDP client) is sufficient to run the course software if you are incapable of installation onto your own laptop.

1.10.2 Learning Management System

Blackboard(BB) is used as the learning management system (LMS) for this class and all exercises are to be uploaded to BB. Late submissions are accepted, but scores are be reduced by at least 50%.

1.10.3 Instructor Notes

The instructor notes are located at http://54.243.252.9/ce-3105-webroot/ce3105notes/_build/html/intro.html

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[11]: %%html
<style> table {margin-left: 0 !important;} </style>
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<IPython.core.display.HTML object>

1.11 Course Schedule

date	topic	readings	homework
21-28 Aug 2022	Week 1 - No Labs (Partial Week)	Link 2 Syllabus	
29 Aug - 3 Sep 22	Week 2 - Introduction - Laboratory Safety - Team Assignments - Lab Reports	- Laboratory Safety - Lab Reports	
5-11 Sep 2022	Week 3 - No Labs (Labor Day)		- Online Safety Training
12-18 Sep 2022	Week 4 - Fluid Properties - Syllabus - Team Assignments	- Laboratory 1	
19-25 Sep 2022	Week 5 - No Labs (Job Fair)		
26 Sep - 2 Oct 2022	Week 6 - Displacement - Archimedes Principle - Bouyancy	- Laboratory 2	
3-9 Oct 2022	Week 7 - Flow Measurement - Syllabus - Team Assignments	- Laboratory 3	
10-16 Oct 2022	Week 8 - Friction Loss in a Pipe - Syllabus - Team Assignments	- Laboratory 4	
17-23 Oct 2022	Week 9 - Fitting Losses in a Pipe Network - Syllabus - Team Assignments	- Laboratory 5	

date	topic	readings	homework
24-30 Oct 2022	Week 10 - Momentum Transfer - Jet Impact on a Plate - Team Assignments	- Laboratory 6	
31 Oct - 6 Nov 2022	Week 11 - No Labs (Refitting for Pumps and Open Channel Flow)		
7-13 Nov 2022	Week 12 - Pump Performance - Syllabus - Team Assignments	- Laboratory 7	
14-20 Nov 2022	Week 13- Friction Losses in an Open Channel - Syllabus - Team Assignments	- Laboratory 8	
21-27 Nov 2022	Week 14 - Syllabus - Team Assignments	- reading link	
28 Nov - 4 Dec 2022 5-10 Dec			

1.12 Course Assessment and Grading Criteria:

There will be 8-9 laboratory reports, 8-9 BB tests (quizzes), and 8-9 effort reports.

Late assignments will be **ignored** (not even examined).

Grades will be based on the following components; weighting is approximate:

Assessment Instrument	Weight(%)
Laboratory Reports	60
Effort Reports	10
BB Quizzes	30
Overall total	100

Letter grades will be assigned using the following proportions:

Normalized Score Range	Letter Grade
90	A
80-89	B
70-79	C
55-69	D

Normalized Score Range	Letter Grade
< 55	F

1.13 Classroom Policy:

The following activities are not allowed in the classroom/laboratory: Texting or talking on the cellphone or other electronic devices, and reading non-course related materials.

1.14 ADA Statement:

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make necessary arrangements. Students must present appropriate verification from Student Disability Services during the instructor's office hours. Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services office in 335 West Hall or call 806.742.2405.

1.15 Academic Integrity Statement:

Academic integrity is taking responsibility for one's own class and/or course work, being individually accountable, and demonstrating intellectual honesty and ethical behavior. Academic integrity is a personal choice to abide by the standards of intellectual honesty and responsibility. Because education is a shared effort to achieve learning through the exchange of ideas, students, faculty, and staff have the collective responsibility to build mutual trust and respect. Ethical behavior and independent thought are essential for the highest level of academic achievement, which then must be measured. Academic achievement includes scholarship, teaching, and learning, all of which are shared endeavors. Grades are a device used to quantify the successful accumulation of knowledge through learning. Adhering to the standards of academic integrity ensures grades are earned honestly. Academic integrity is the foundation upon which students, faculty, and staff build their educational and professional careers. [Texas Tech University ("University") Quality Enhancement Plan, Academic Integrity Task Force, 2010].

1.16 Religious Holy Day Statement:

"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

1.17 Ethical Conduct Policy:

Cheating is prohibited, and the representation of the work of another person as your own will be grounds for receiving a failing grade in the course.

DISCRIMINATION, HARASSMENT, AND SEXUAL VIOLENCE STATEMENT:

Texas Tech University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from gender and/or sex discrimination of any kind. Sexual assault, discrimination, harassment, and other Title IX violations are not tolerated by the University. Report any incidents to the Office for Student Rights & Resolution, (806)-742-SAFE (7233) or file a report online at titleix.ttu.edu/students. Faculty and staff members at TTU are committed to connecting you to resources on campus. Some of these available resources are: TTU Student Counseling Center, 806- 742-3674, <https://www.depts.ttu.edu/scc/> (Provides confidential support on campus.) TTU 24-hour Crisis Helpline, 806-742-5555, (Assists students who are experiencing a mental health or interpersonal violence crisis. If you call the helpline, you will speak with a mental health counselor.) Voice of Hope Lubbock Rape Crisis Center, 806-763-7273, voiceofhopelubbock.org (24-hour hotline that provides support for survivors of sexual violence.) The Risk, Intervention, Safety and Education (RISE) Office, 806-742-2110, <https://www.depts.ttu.edu/rise/> (Provides a range of resources and support options focused on prevention education and student wellness.) Texas Tech Police Department, 806-742- 3931, <http://www.depts.ttu.edu/tttd/> (To report criminal activity that occurs on or near Texas Tech campus.)

CIVILITY IN THE CLASSROOM STATEMENT: Texas Tech University is a community of faculty, students, and staff that enjoys an expectation of cooperation, professionalism, and civility during the conduct of all forms of university business, including the conduct of student–student and student–faculty interactions in and out of the classroom. Further, the classroom is a setting in which an exchange of ideas and creative thinking should be encouraged and where intellectual growth and development are fostered. Students who disrupt this classroom mission by rude, sarcastic, threatening, abusive or obscene language and/or behavior will be subject to appropriate sanctions according to university policy. Likewise, faculty members are expected to maintain the highest standards of professionalism in all interactions with all constituents of the university. To ensure that you are fully engaged in class discussions and account team meetings during class time, you are expected to do the following: - Maintain the same level of civility and professionalism that would be expected in a face-to-face classroom setting. - Attend all classes regularly. - Log into the video conference on time and remain logged in for the duration of the class period. - Activate your camera so that you are visible to the instructor and other students in the class. If you have concerns about leaving your camera on (such as childcare obligations, privacy issues, or a particular circumstance during a class period), please talk to the instructor. - Refrain from engaging in non-class related activities during class time that create a distraction for other students in the class and/or limit your ability to engage in the course. Failure to meet these expectations may result in the following consequences: 1. Being counted as absent for the class meeting. 2. Not receiving credit for class participation for that class period. 3. Other consequences as stipulated in the syllabus, Texas Tech Code of Student Conduct, or other university policy. Repeated failure to meet expectations (e.g., attendance, participation in class, etc.), in addition to the above consequences, may result in the one or more of the following consequences: 1. Referral to the appropriate Associate Dean. 2. Academic penalty, ranging from a warning to failure of the course. (www.depts.ttu.edu/ethics/matadorchallenge/ethicalprinciples.php).

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