

## MEET 3940/Fluid mechanics applications

### Instructor Contact

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**Phone Number:** 940-369-8266

**Class meetings:** Lecture, We 12:00PM - 1:50PM, F119; Lab, Fr 11:30AM - 2:20PM, F158

**Office Hours:** Mo 1:00pm - 3:00pm, We 2:30pm - 3:30pm or by appointment.

**Email:** maurizio.manzo@unt.edu

**Communication Expectations:** The instructor will communicate primarily through email and Canvas. Please, use my email to contact me with any questions and I will get back to you within a day. Moreover, feedbacks on assignments will be provided within a week from the due date. All course material will be posted on Canvas. HW will be posted on Canvas. Course announcement and email through Canvas will be used to communicate with the students. All graded HW and exam will be posted on Canvas.

CLEAR has a webpage for students that provides [Online Communication Tips](https://clear.unt.edu/online-communication-tips) (<https://clear.unt.edu/online-communication-tips>) that instructors can share with students and/or adapt for their own uses.

### Welcome to UNT!

As members of the UNT community, we have all made a commitment to be part of an institution that respects and values the identities of the students and employees with whom we interact. UNT does not tolerate identity-based discrimination, harassment, and retaliation. UNT's full Non-Discrimination Policy can be found in the UNT Policies section of the syllabus.

### Course Description

Study of incompressible fluid mechanics, including pressure, force and velocity; hydraulic fluid power circuits and systems as used in industrial applications

### Course Structure

The schedule and topics covered are subjected to change during the semester.

Week	Date	Lecture	Lab
1	8/20 8/22	Syllabus and policy discussion	Lab report and grading
2	8/27 8/29	Introduction to fluid mechanics and hydraulics (Viscosity of fluid)	Intro to experimental measurements
3	9/3 9/5	Pressure	Fluid Properties
4	9/10 9/12	Forces due to static fluids	Forces measurements
5	9/17 9/19	Exam1	Make up lab #1

6	9/24 9/26	Continuity equation, Bernoulli's equation	Center of gravity and Metacentric height
7	10/1 10/3	General energy equation	Velocity Measurement in a wind Tunnel
8	10/8 10/10	Reynold's Number, Major losses	ANSYS
9	10/15 10/17	Minor losses	Hydraulic systems
10	10/22 10/24	Exam2	Energy Losses in Pipes
11	10/29 10/31	Forces due to fluids in motion, Drag and Lift	Make up lab #2
12	11/5 11/7	Forces due to fluids in motion, Drag and Lift (cont)	Flow around a cylinder
13	11/12 11/14	Series pipeline systems	Drag measurements in a wind tunnel
14	11/19 11/21	Series pipeline systems (cont)	Hydroflo
15	11/26 11/28	Parallel pipeline systems	ANSYS
16	12/3	Course conclusion	
	12/10	Final Project 10:30-12:30 PM	

### Course Prerequisites or Other Restrictions

ENGR 2302

### Course Objectives

By the end of this course, students will be able to:

1. Identify fluid properties and forces exerted by fluids.
2. Describe the different types of fluid flow (laminar and turbulent) and types of hydraulic systems (series and parallel).
3. Calculate pressure and forces in general in static fluid; calculate Reynolds number and losses in fluid systems.
4. Predict the behavior of a fluid system based on the Bernoulli, continuity, and general energy equations.
5. Select the right tabulated experimental data to solve practical problems.
6. Be able to perform measurements in a lab environment and use fluid mechanics commercial software packages.

### ABET CLO

ABET #4: an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes

## Materials

Textbook: Robert L. Mott and Joseph A. Untener, “Applied Fluid Mechanics”, 8th Edition Prentice Hall, ISBN-13: 9780135577172 ISBN-13: 9780135577158

Software usage: Hydroflo, ANSYS Fluent

## Teaching Philosophy

This course will teach you fundamentals of fluid mechanics. Practical examples will help you grasp concepts and best practices. A balance between theoretical and practical activities is very important: “He who loves **practice without theory** is like the sailor who boards ship **without** a rudder and compass and never knows where he may cast”, by Leonardo DaVinci.

It is expected that students interact with the instructor and among themselves, asking questions and participating actively to the class.

As a student in this course, you are responsible for

- reading and completing all requirements of the course in a timely manner,
- working to remain attentive and engaged in the course and interact with your fellow students,
- and, assisting in maintaining a positive learning environment for everyone.

## Technical Assistance

Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

**UIT Help Desk:** [UIT Student Help Desk site](http://www.unt.edu/helpdesk/index.htm) (<http://www.unt.edu/helpdesk/index.htm>)

**Email:** [helpdesk@unt.edu](mailto:helpdesk@unt.edu)

**Phone:** 940-565-2324

**In Person:** Sage Hall, Room 130

**Walk-In Availability:** 8am-9pm

**Telephone Availability:**

- Sunday: noon-midnight
- Monday-Thursday: 8am-midnight
- Friday: 8am-8pm
- Saturday: 9am-5pm

**Laptop Checkout:** 8am-7pm

For additional support, visit [Canvas Technical Help](https://community.canvaslms.com/docs/DOC-10554-4212710328) (<https://community.canvaslms.com/docs/DOC-10554-4212710328>)

## Rules of Engagement

Rules of engagement refer to the way students are expected to interact with each other and with their instructors. Here are some general guidelines:

- While the freedom to express yourself is a fundamental human right, any communication that utilizes cruel and derogatory language on the basis of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law will not be tolerated.
- Treat your instructor and classmates with respect in any communication online or face-to-face, even when their opinion differs from your own.
- Ask for and use the correct name and pronouns for your instructor and classmates.
- Speak from personal experiences. Use “I” statements to share thoughts and feelings. Try not to speak on behalf of groups or other individual’s experiences.
- Use your critical thinking skills to challenge other people’s ideas, instead of attacking individuals.
- Avoid using all caps while communicating digitally. This may be interpreted as “YELLING!”
- Be cautious when using humor or sarcasm in emails or discussion posts as tone can be difficult to interpret digitally.
- Avoid using “text-talk” unless explicitly permitted by your instructor.
- Proofread and fact-check your sources.
- Keep in mind that online posts can be permanent, so think first before you type.

See these [Engagement Guidelines](https://clear.unt.edu/online-communication-tips) (https://clear.unt.edu/online-communication-tips) for more information.

## Course Requirements

List all required assignments and graded activities for the course, along with a short description and the points possible. Best practice is to clearly indicate both points and percentages if you are using both in the course. Here is a table example below:

<b><i>Assignment</i></b>	<b><i>Percentage of Final Grade</i></b>
<b><i>Homework</i></b>	<b><i>10%</i></b>
<b><i>Exam 1</i></b>	<b><i>15%</i></b>
<b><i>Exam 2</i></b>	<b><i>15%</i></b>
<b><i>Final project</i></b>	<b><i>15%</i></b>
<b><i>Laboratory reports</i></b>	<b><i>40%</i></b>
<b><i>Attendance</i></b>	<b><i>5%</i></b>
<b><i>Total Points Possible</i></b>	<b><i>100%</i></b>

## Grading

Include the grading scale (A-F) along with the point totals/percentages you will use to calculate the final grade. For example:

A = 81-100

B = 71-80

C = 61-70

D = 51-60

F = 0-50

The instructor reserves the right to change the grade distribution at the end of the semester. If any changes occur, the changes will be less stringent than the distribution above.

Late work will be considered only under extreme circumstances **and will be** heavily penalized. Make-up exams may be granted for excused (i.e. official university) absences.

### Course Evaluation

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course.

### Course Policies

#### Attendance Policy

Attendance is crucial. Students are expected to attend class meetings regularly and to abide by the attendance policy established for the course. It is important that you communicate with the professor and the instructional team prior to being absent, so you, the professor, and the instructional team can discuss and mitigate the impact of the absence on your attainment of course learning goals. Please inform the professor and instructional team if you are unable to attend class meetings because you are ill, in mindfulness of the health and safety of everyone in our community.

#### Class Participation

Attendance is mandatory. Lectures, videos, and class discussions will contain vital information needed to do well on the exams.

#### Late Work

UNT instructors do not accept late work. Late work will be considered only under extreme circumstances and will be heavily penalized. Make-up exams may be granted for excused (i.e. official university) absences.

#### Examination Policy

Open book with time limit during class hours. Extra time will be given to upload your work on Canvas. No late work will be accepted. If internet or computer problems, you should notify immediately the instructor via email within the deadline. If any issue regarding technology, please contact Student Helpdesk to open a ticket and have that sent to the instructor.

#### Assignment Policy

Assignment instructions are found in Canvas, assignments should be saved as (.pdf only before submission).

If issues due to server unavailability or other technical please contact Student Help Desk and the instructor before the deadline. A ticket should be created and send to the instructor as a proof if pertinent. See below instruction:

The University is committed to providing a reliable online course system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will extend the time windows and provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and contact the UNT Student Help Desk: [helpdesk@unt.edu](mailto:helpdesk@unt.edu) or 940.565.2324 and obtain a ticket number. The instructor and the UNT Student Help Desk will work with the student to resolve any issues at the earliest possible time.

### Instructor Responsibilities and Feedback

- providing course materials that will assist and enhance your achievement of the stated course goals, guidance,
- providing timely and helpful feedback within the stated guidelines,
- and, assisting in maintaining a positive learning environment for everyone.

### Syllabus Change Policy

Provide information as to policies regarding changes to the syllabus, course information, due dates.

- [MathLab](https://math.unt.edu/mathlab) (<https://math.unt.edu/mathlab>)

### UNT Policies

#### Academic Integrity Policy

Academic Integrity Standards and Consequences. According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. [Insert specific sanction or academic penalty for specific academic integrity violation.]

#### ADA Policy

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the [ODA website](https://disability.unt.edu/) (<https://disability.unt.edu/>).

#### Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)

The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability,

genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

### Emergency Notification & Procedures

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

### Retention of Student Records

Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual record; however, information about student's records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University's policy. See UNT Policy 10.10, Records Management and Retention for additional information.

### Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's [Code of Student Conduct](https://deanofstudents.unt.edu/conduct) (https://deanofstudents.unt.edu/conduct) to learn more.

### Access to Information - Eagle Connect

Students' access point for business and academic services at UNT is located at: [my.unt.edu](https://my.unt.edu). All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail [Eagle Connect](https://it.unt.edu/eagleconnect) (https://it.unt.edu/eagleconnect).

### Student Evaluation Administration Dates

Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13, 14 and 15 [insert administration dates] of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" ([no-reply@iasystem.org](mailto:no-reply@iasystem.org)) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has

been submitted. For additional information, please visit the [SPOT website](http://spot.unt.edu/) (<http://spot.unt.edu/>) or email [spot@unt.edu](mailto:spot@unt.edu).

### Sexual Assault Prevention

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking, and/or sexual assault, there are campus resources available to provide support and assistance. UNT's Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim's compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at [SurvivorAdvocate@unt.edu](mailto:SurvivorAdvocate@unt.edu) or by calling the Dean of Students Office at 940-565- 2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at [oeo@unt.edu](mailto:oeo@unt.edu) or at (940) 565 2759.

### Important Notice for F-1 Students taking Distance Education Courses

#### **Federal Regulation**

To read detailed Immigration and Customs Enforcement regulations for F-1 students taking online courses, please go to the [Electronic Code of Federal Regulations website](http://www.ecfr.gov/) (<http://www.ecfr.gov/>). The specific portion concerning distance education courses is located at Title 8 CFR 214.2 Paragraph (f)(6)(i)(G).

The paragraph reads:

(G) For F-1 students enrolled in classes for credit or classroom hours, no more than the equivalent of one class or three credits per session, term, semester, trimester, or quarter may be counted toward the full course of study requirement if the class is taken on-line or through distance education and does not require the student's physical attendance for classes, examination or other purposes integral to completion of the class. An on-line or distance education course is a course that is offered principally through the use of television, audio, or computer transmission including open broadcast, closed circuit, cable, microwave, or satellite, audio conferencing, or computer conferencing. If the F-1 student's course of study is in a language study program, no on-line or distance education classes may be considered to count toward a student's full course of study requirement.

#### **University of North Texas Compliance**

To comply with immigration regulations, an F-1 visa holder within the United States may need to engage in an on-campus experiential component for this course. This component (which must be approved in advance by the instructor) can include activities such as taking an on-campus exam, participating in an on-campus lecture or lab activity, or other on-campus experience integral to the completion of this course.

If such an on-campus activity is required, it is the student's responsibility to do the following:



(1) Submit a written request to the instructor for an on-campus experiential component within one week of the start of the course.

(2) Ensure that the activity on campus takes place and the instructor documents it in writing with a notice sent to the International Student and Scholar Services Office. ISSS has a form available that you may use for this purpose.

Because the decision may have serious immigration consequences, if an F-1 student is unsure about his or her need to participate in an on-campus experiential component for this course, s/he should contact the UNT International Student and Scholar Services Office (telephone 940-565-2195 or email [internationaladvising@unt.edu](mailto:internationaladvising@unt.edu)) to get clarification before the one-week deadline.

### Student Verification

UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See [UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses](https://policy.unt.edu/policy/07-002) (<https://policy.unt.edu/policy/07-002>).

### Use of Student Work

A student owns the copyright for all work (e.g. software, photographs, reports, presentations, and email postings) he or she creates within a class and the University is not entitled to use any student work without the student's permission unless all of the following criteria are met:

- The work is used only once.
- The work is not used in its entirety.
- Use of the work does not affect any potential profits from the work.
- The student is not identified.
- The work is identified as student work.

If the use of the work does not meet all of the above criteria, then the University office or department using the work must obtain the student's written permission.

Download the UNT System Permission, Waiver and Release Form

### Transmission and Recording of Student Images in Electronically-Delivered Courses

1. No permission is needed from a student for his or her image or voice to be transmitted live via videoconference or streaming media, but all students should be informed when courses are to be conducted using either method of delivery.
2. In the event an instructor records student presentations, he or she must obtain permission from the student using a signed release in order to use the recording for future classes in accordance with the Use of Student-Created Work guidelines above.

3. Instructors who video-record their class lectures with the intention of re-using some or all of recordings for future class offerings must notify students on the course syllabus if students' images may appear on video. Instructors are also advised to provide accommodation for students who do not wish to appear in class recordings.

This course employs lecture capture technology to record class sessions. Students may occasionally appear on video. The lecture recordings will be available to you for study purposes and may also be reused in future course offerings.

No notification is needed if only audio and slide capture is used or if the video only records the instructor's image. However, the instructor is encouraged to let students know the recordings will be available to them for study purposes.

### Class Recordings & Student Likenesses

Synchronous (live) sessions in this course will be recorded for students enrolled in this class section to refer to throughout the semester. Class recordings are the intellectual property of the university or instructor and are reserved for use only by students in this class and only for educational purposes. Students may not post or otherwise share the recordings outside the class, or outside the Canvas Learning Management System, in any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct and could lead to disciplinary action.

## Academic Support & Student Services

### Student Support Services

#### *Mental Health*

UNT provides mental health resources to students to help ensure there are numerous outlets to turn to that wholeheartedly care for and are there for students in need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

- [Student Health and Wellness Center](https://studentaffairs.unt.edu/student-health-and-wellness-center) (<https://studentaffairs.unt.edu/student-health-and-wellness-center>)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (<https://studentaffairs.unt.edu/counseling-and-testing-services>)
- [UNT Care Team](https://studentaffairs.unt.edu/care) (<https://studentaffairs.unt.edu/care>)
- [UNT Psychiatric Services](https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry) (<https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry>)
- [Individual Counseling](https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling) (<https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling>)

### Use of AI Tools in MEET 3940

The use of AI tools (e.g., ChatGPT, Copilot, Gemini) can be beneficial for generating ideas, summarizing concepts, or assisting with writing, but they must be used responsibly, ethically, and in alignment with course learning objectives.

## 1. Permission Levels

For each assignment, the problem statement will indicate one of the following categories:

- Explicitly Allowed – AI tools may be used for brainstorming, proofreading, grammar/style refinement, summarization, generating ideas/outlines, or coding assistance, provided all AI contributions are disclosed.
- Limited Use – AI may be used for conceptual explanations or tutoring assistance, but not for generating entire solutions, essays, or problem sets unless specifically permitted.
- Prohibited – AI-generated content must not replace original student work in assignments requiring personal reflection, analytical reasoning, problem-solving, or research synthesis. AI use during exams or quizzes is strictly forbidden.

## 2. Documentation Requirement

If you use AI for any part of your work:

1. Include an AI usage disclosure statement at the end of your submission.  
Example (Basic Acknowledgment):  
  
“I used ChatGPT to help refine the organization of my homework. All content, calculations, and ideas are my own.”
2. For substantial AI input, use a Detailed or Reflection-Based acknowledgment:
  - Detailed – Tool used, purpose, type of output, and modifications made.
  - Reflection-Based – In addition to the above, reflect on how AI shaped your learning and what you verified independently.
3. Failure to disclose AI usage may be considered academic dishonesty under UNT’s Academic Integrity Policy and could result in grade penalties or referral for review.

## 3. Ethical & Accuracy Expectations

- AI is a learning aid, not a substitute for your own understanding.
- You are responsible for verifying technical accuracy of AI-generated content.
- Cross-check AI outputs with the textbook, lecture notes, or reputable sources before submission.

## 4. Consequences for Misuse

If AI is used in violation of the assignment’s permission level, or without disclosure:

1. Revision required with proper attribution.
2. Grade penalty of up to -20% for undisclosed AI use.
3. Referral to academic integrity review for repeated violations.
4. Restorative options may include writing a reflection on responsible AI use or completing an alternate assignment.

## 5. Why This Policy Exists

The goal is to help you develop critical thinking, problem-solving, and engineering judgment while learning to use emerging tools appropriately. Using AI responsibly will prepare you for professional practice where such tools are common but must be applied with care.