

MEET 3940– Fluid Mechanics Applications

Course Catalogue:

MEET 3940. Fluid Mechanics Applications. 3 hours (2;2)

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

Time and Place

Lecture, M 09:30-11:20 AM, NTDP F187; Lab., F 09:30-12:20 AM, F185

Prerequisite

Prerequisite(s): ENGR 2302

Instructor

Maurizio Manzo, Ph.D.

Office: NTDP F115-W

Phone: 940-369-8266

E-mail: maurizio.manzo@unt.edu

Office Hours

M&F 2:00-4:00 PM, or by appointment (if the door is open you can enter and ask as well!)

TA

Iris Hill

IrisHill@my.unt.edu

Office Hours

T 10:00-11:00 AM; F 11:30-1:30 PM

Textbook

Robert L. Mott and Joseph A. Untener, “Applied Fluid Mechanics”, 7th Edition Prentice Hall, ISBN-9780132558921

Computer usage

Hydroflow, ANSYS

Evaluation

Homework	5%
Lab Assignments	30%
Exam I	20%
Exam II	20%
Exam III	20%
Final	25%
Attendance	5% extra

The lowest grade among the Exams 1, 2, and 3 will be dropped.

It is your responsibility to attend the exams. Make-up exams may be granted for excused (i.e. official university) absences. The lowest exam grade will be dropped.

Letter grades will be based on following scale:

A: 90-100%; B: 80-89%; C: 70-79%; D: 60-69%; F: < 60%.

Homework

Homework assignment should be handed in the class during class time. **No late homework** unless pre-approved and/or under special circumstances. No any late homework will be accepted unless supported by an official university policy excuse.

CHEATING IS STRICLTY NOT ALLOWED

Course Objectives (ABET outcomes)

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

Course Outline

This is a tentative course outline. Instructor will attempt to follow it closely and reserves the right to substitute any other relevant material at any point throughout the course.

Week	Date	Lecture	Lab
1	8/27-8/31	Syllabus discussion and introduction to fluid mechanics	Introduction to Experimental Measurements
2	9/3-9/7	Labor Day	Same as previous-second group
3	9/10-9/14	Pressure, Manometers	Fluid Properties I
4	9/17-9/21	Forces due to static fluids	Same as previous-second group
5	9/24-9/28	Exam 1	Fluid Properties II
6	10/1-10/5	Buoyancy and stability	Same as previous-second group
7	10/8-10/12	Continuity equation, Bernoulli's equation	Flow over Airfoil-FLUENT
8	10/15-10/19	General energy equation	Same as previous-second group
9	10/22-10/26	Reynold's Number, Major losses	Velocity Measurement in Wind Tunnel
10	10/29-11/2	Exam 2	Same as previous-second group
11	11/5-11/9	Series pipeline systems	Hydroflow
12	11/12-11/16	Series pipeline systems-cont	Same as previous-second group
13	11/19-11/23	Parallel pipeline systems	Drag Measurements in a Wind

			Tunnel
14	11/26-11/30	Exam 3	Same as previous-second group
15	12/3-12/6	Forces due to fluids in motion, Drag and Lift	No lab
	12/12	Final Exam	

The class will be splitted into two groups at the beginning of the semester and will alternate on Friday's for the experimental part.

Policies and Procedures Note: The course outline above is subject to change depending upon the overall course progress.

1. Attendance: Attendance is mandatory. Lectures, videos, and class discussions will contain vital information needed to do well on the exams. Be on time, three "late" arrivals will result in one "nonattendance".
2. Six "non-attendance" will result to a drop from the course.
3. Tardiness: If you arrive late, please enter quietly and sit down. Do not walk in front of speakers or disrupt the class in any other way.
4. Cell Phones: Please remember to turn off phones prior to class.
5. The course website, Blackboard Learn, at learn.unt.edu may be used for posting course materials, assignments, and grades, as well as for email communications. Students are encouraged to check the course website often.
6. Students will complete regularly assigned homework. Homework have to be submitted on time by the following week for grading. Late submissions will get zero grade. Hw are handed in class by hand from each individual student. No excuse.
7. This course provides opportunities for students to take advantage of several software packages supported by the department in the classroom in simulation studies, homework assignments, or in projects.
8. There will be no make-up exams or assignments unless you have a documented university excused absence. If you know in advance that you will miss an exam, you must contact instructor before the scheduled exam.
9. This syllabus is subject to change at any time during the semester with changes to be announced in class.
10. 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 that the distribution above.
11. All rules relating to academic dishonesty will be enforced in accordance with University policies. Cheating on examinations and laboratory assignments, and plagiarism on various papers and reports are types of disciplinary misconduct for which penalties are assessed under the UNT Code of Student Conduct and Discipline. Major responsibility for implementing the University's policy on scholastic dishonesty rests with the faculty. Be advised that the instructor of this course supports and fully implements this policy. The following actions will be taken when evidence of such misconduct is observed. The student will be presented with the evidence of misconduct and given an opportunity to explain the same. Based on the outcome of this private conference, the matter will be either dropped or the student will be given a grade of

- "F" in the course and be referred to the Dean of Students for further counseling and/or disciplinary action.
12. Students are responsible to protect their work so it is not available to others for submission as their efforts. This is especially true of files that are generated on the computer. Students who knowingly allow others to use their work are partners in this unethical behavior.
 13. An I (incomplete) grade is given only for extenuating circumstances and in accordance with University and Departmental Policies.
 14. Discussion and exchange of ideas are important parts of the learning process and I encourage collaboration in a community of scholars. However, you must be sure the work you submit for grading is your own. Submitted works that are copies from solution manuals or website solutions or your classmates will be treated as plagiarism.
 15. Grades are based in part on the student's ability to communicate. You must present your entire solution in an orderly way for each problem. Full grade points will be assigned only on the correct final answers with correct steps. You must show complete process of your solution. Partial credits will be assigned for correct steps taken towards the solution.
 16. Requests for the review of a graded exam/assignment must be made within one week of the grade announcement. Upon review, the exam/assignment score may increase, remain the same, or decrease.
 17. The Student Perception of Teaching (SPOT) Evaluation is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SPOT to be an important part of your participation in this class.

Disabilities Accommodation

The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodations of their disabilities. If you believe that you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940 565-4343 during the first week of class.