

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, MW 09:30-10:20 AM, NTDP D201; Lab., F 09:30-12:20 AM, F185

Prerequisite

Prerequisite(s): ENGR 2302

Instructor

Maurizio Manzo, Ph.D.

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Office Hours

TR 09:00-10:00 AM or by appointment

Textbook

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

Evaluation

Homework	10%
Quizzes/Attendance	10%
Lab Assignments	20%
Exam I	20%
Exam II	20%
Final Exam	20%

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

Letter grades will be based on following scale:

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

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

Homework

Homework assignment is made every week and it should be handed in the class during class time a week later. 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.

Course Objectives (ABET\ASME program outcomes and program educational objectives supported)

1. Understand the laws of fluid mechanics. (a, b, d, f, l, m)
2. Understand the exercises, and computer software activities in fluid mechanics. (c, d, e, f, l, m)
3. Understand the software, including programming, of fluid mechanics. (d, e, l, m)

Student Learning Outcomes (Course objectives supported)

- a. Analyze problems that incorporate fluid properties. (1)
- b. Evaluate problems of Pascal's Law. (1)
- c. Evaluate manometers related problems. (1)
- d. Analyze problems of fluid statics. (1, 2, 3)
- e. Formulate problems that incorporate the Bernoulli and the Continuity Equations. (1)
- f. Evaluate problems that incorporate the Energy Conservation and the Continuity Equations. (1, 2, 3)
- g. Evaluate problems of the Hazen-William Formula for water flows. (1)
- h. Analyze and evaluate Complex Class I, II, and III Problems. (1, 2, 3)
- i. Design and evaluate complex network problems. (1, 2, 3)
- j. Evaluate pump selection problems. (1, 2, 3)

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	Chap	Lecture	Lab
1	1	Introduction to fluid mechanics	Introduction
2	2	Viscosity, Fluid properties	HydroFlo
3	3	Pressure, Manometers	Fluid Properties
4	4	Forces due to static fluids	Force on Plate
5		Review of Chaps. 1-4, Exam 1	Hydraulic/Pneumatic I
6	5	Buoyancy and stability	Hydraulic/Pneumatic II
7	6	Continuity equation, Bernoulli's equation	Velocity Measurement in Wind Tunnel
8	7	General energy equation	Drag and Lift
9	8	Reynold's Number, Major losses	Multimedia Fluid Mechanics
10	9, 10	Velocity profiles, Minor losses	Pump Selection
11		Review of chapters 5-10, Exam 2	Pump Performance
12	11	Series pipeline systems, Class I, II, III systems	Designing Class I System
13	12	Parallel pipeline systems	Designing Class II/ III Systems
14	16, 17	Forces due to fluids in motion, Drag and Lift	
15		Review (all chapters.)	

16		Final Exam (all chapters.). TBD	
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Policies and Procedures

1. Attendance is required, and will be taken regularly at the beginning of the classes. Discussions and demonstrations during both lecture and lab sessions contain important information to do well on exams.
2. 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.
3. Students will complete regularly assigned homework and lab reports. Both homework and lab reports have to be submitted on time -by the following week for grading. Late submissions will get zero grade. While the handwritten homework can be turned in to the Instructor or TA, lab reports should be submitted in pdf format through the Blackboard Learn.
4. This course provides opportunities for students to take advantage of several software packages supported by the department in the classroom or in lab experiments, in simulation studies, homework assignments, or in projects.
5. 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.
6. This syllabus is subject to change at any time during the semester with changes to be announced in class.
7. 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.
8. 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.
9. 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.
10. An I (incomplete) grade is given only for extenuating circumstances and in accordance with University and Departmental Policies.
11. 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.
12. 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.
 13. 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.
 14. 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.