

MENG 3211 – Thermal-Fluids Lab
Course Syllabus

Semester / Year	Spring 2025
Catalog Description	Introduction to basic Thermal/Fluid sciences laboratory procedures and practices. Experimental topics to include fluid flow, heat exchanger basics, and basics of refrigeration. Student teams will design, analyze and document an experimental procedure. All procedures will result in a professional quality laboratory report.
Prerequisites	Grade C or better in MENG 3210, MENG 3401, and MENG 3310.
Section Number(s)	Lecture: MENG 3211.030 Lab: MENG 3211.031L, MENG 3211.032L, MENG 3211.033L
Instructor(s)	Dr. Soren Maloney and Ola Al-Shalash
Contact info	Email: smaloney@uttyler.edu , HEC A206 Email: oolshalash@uttyler.edu , HEC A212
Class Type / Location	Lecture 030: Face-to-face , HEC C204 Lab 031L, 032L, 033L: Face-to-face , HEC B222
Class Times	MENG 3211.030: Monday: 12:20PM – 1:15PM MENG 3211.031L: Monday: 2:00PM – 4:45PM MENG 3211.032L: Wednesday: 2:00PM – 4:45PM MENG3211.033L: Friday: 11:00AM – 1:45PM
Office Hours	M/W: 9:30AM to 11:00AM, or by appointment
Credits	2 (1 hour lecture and 3 hours laboratory per week)
Textbooks and Reference Materials	Electronic textbook (supported by OER grant) provided by instructor on Canvas
Optional References	Textbooks from Experimental Measurements and Techniques Lab, Fluid Mechanics, Thermodynamics and Heat Transfer courses. In addition, <ul style="list-style-type: none"> 1. Morris, Alan S. Langari, Reza. (2012). Measurement and Instrumentation Theory and Application. Elsevier. (https://app.knovel.com/hotlink/toc/id:kpMITA0001/measurement-instrumentation/measurement-instrumentation) 2. Design of Fluid Thermal Systems, 4th ed. (SI edition), by W.S. Janna, Cengage Learning, 2010
Additional requirements	Laboratory equipment manuals and lab handouts. AI is permitted only for specific assignments or situations, and appropriate acknowledgment is required. Software available through virtual desktop – one.uttyler.edu and IT support.
Evaluation Method/	Assignments & Quizzes: 20% Midterm Exam – 20%

	<p>Lab Reports: 40%</p> <p>Design Project – 20%</p>
Grading Policy / Scale	<p>Grading in this course will be based on the following: Scale: A => 90, B => 80, C => 70, D => 60, F < 60.</p> <p>Grade appeal: grades can be appealed by meeting the instructor during office hours, but no later than a week after the grade has been given.</p>
Important events/dates	<ol style="list-style-type: none"> 1. Census date: 1/27/2025 (Mo) 2. Midterm Exam: 3/10/2025 (Mo) 3. Last Day to withdraw from one or more courses: 3/31/2025 (Mo)
Attendance / Makeup policy/Other rules	<ol style="list-style-type: none"> 1. Lecture attendance will be checked regularly using Canvas. Students who come to class after attendance is taken will be considered absent. 2. Lab attendance is mandatory. Failure in attending a lab will result in a zero grade in the corresponding lab report. 3. No make-up exam(s) will be provided unless a university accepted excused absence is submitted with accompanying documentation justifying the absence. 4. Email submission of assignments, homework, lab reports will not be accepted. All assignments MUST be submitted to Canvas for grading. 5. Late submissions of assignments, homework, lab reports if due at 11:59:00 pm, and received any time after 11:59:00 pm is considered late and will result in a 20 % deduction per day from the graded score. 6. Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements 7. Attendance is expected per university policy. Regular attendance is highly recommended. It is imperative if you want to do well in this course. 8. In case you must miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made in the class. 9. Students will not be permitted to leave the classroom during lectures except for extreme emergencies. 10. Questions involving knowledge covered in class will be answered if the student proves that they have tried to come up with the answer. 11. Solution to homework and focus problems will not be given. However, students can work on the right solution by checking their work with the instructor. 12. Any minor violation of the Student Behavior (see below) by a student as deemed by the instructor will result in a full letter grade

	<p>reduction for each incident while any major violation(s), such as cheating and plagiarism, by a student as deemed by the instructor will result in automatic failing grade in the course.</p> <p>13. The use of cellular phones during lectures, lab sessions and exams is strictly prohibited.</p> <p>14. No food is allowed in the classroom or laboratories.</p> <p>15. Students are encouraged to utilize any tutoring services available if needed and come prepared to each week's class. For group assignments, each student is expected to work with the group in a professional manner in case of any group activities. It is important to communicate clearly and professionally any concerns or issues to the instructor.</p> <p>16. Canvas should be the primary mode of contacting the instructor, so consult the Canvas announcements and discussion board to check for information about the course. In addition, your university provided patriots' email should be the official communication method and you should check your email regularly. Emails from external addresses will not be answered. Use the above email address or Canvas messaging to email the instructor. Please use MENG 3211-your section, your question or concern title in the email subject line. Please allow at least one to two business days for a response to your email. Emails with improper language will not be answered. Emails with the same concerns or questions from multiple students will be answered/covered during class time.</p> <p>17. The syllabus is subject to change during the semester as deemed necessary. Students will be notified of any major changes.</p>
<p>Course Learning Objectives / ABET & PEOs relation</p>	<p>By the end of this course students will be able to:</p> <ol style="list-style-type: none"> 1. Apply fluid mechanics concepts for analysis of basic fluid mechanics experiments. 2. Apply heat transfer concepts for analysis of basic heat exchangers. 3. Apply thermal system concepts for analysis of refrigeration and heat pump cycles, and psychometrics processes. 4. Design, perform, and report results of a mechanical engineering experiment. 5. Write professional quality laboratory reports.
<p>Tentative Topics</p>	<ul style="list-style-type: none"> • Fluid mechanics laboratory procedures and devices, analysis and operation. • Basic heat exchangers, analysis and operation. • Basic refrigeration/heat pump devices, analysis and operation. • Self-directed laboratory project/investigation.

University Policies	https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information.pdf
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Course Plan: One, lecture hour on Mondays and one three-hour lab on either Monday, Wednesday or Friday.

Week	Week of	Lecture Activity	Lab Activity
1	Jan 13	Syllabus/Introduction	Lab A: Lab Safety
2	Jan 20	Uncertainty Analysis	Lab B - MathCad Tutorial Course
3	Jan 27	Major Losses in Pipes	Lab C - Uncertainty Analysis with MathCad
4	Feb 3	Minor Losses in Pipes	Lab D - Project expectations and instructions
5	Feb 10	Flow Meters/Venturi Flow	Lab 1 - Losses in Pipes
6	Feb 17	Flow through an orifice	Lab 2 - Venturi Flow
7	Feb 24	Exam 1 Review	Lab 3 - Flow through an orifice
8	Mar 3	Psychometrics/ Refrigeration and Heat Pump Cycles	Work on Project
9	Mar 10	Midterm Exam	Preliminary Project Report Due
10	Mar 17	Spring Break – No Classes	
11	Mar 24	Heat Exchangers I	Lab 4 - Psychometrics/ Refrigeration and Heat Pump Cycles
12	Mar 31	Heat Exchangers II	Lab 5 - Heat Exchangers I
13	Apr 7	Heat Exchangers III	Lab 6 - Heat Exchangers II
14	Apr 14	Supplementary Topic	Work on Project
15	Apr 21	Supplementary Topic	Project Presentations
16	Apr 28	Final Exam Week – Project Reports Due	