UTTyler ENGINEERING

Department of Mechanical Engineering
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MENG 3211 – Thermal-Fluids Laboratory
Course Syllabus

Semester / Year	Spring 2026
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** (Experimental Measurement and Techniques Lab) - **MENG 3401** (Thermodynamics) - **MENG/CENG 3310** (Fluid Mechanics) - and co-requisite EENG 3308
Section number	**Lecture:** MENG 3211.**053** **Lab:** MENG 3211.**059L** **Lab:** MENG 3211.**060L** **Lab:** MENG 3211.**061L**
Instructor name	Ola Al-Shalash and Ahmed Ismail
Contact info	**Office:** Houston Engineering Center: HEC **A212** **Email:** oalshalash@uttyler.edu **Email:** aismail@uttyler.edu
Class Type / Location	**Lecture 053:** Hybrid / HEC B210 **All labs are** Face-to-face / HEC **B222**
Class Time	Attend the following lecture/lab based on myuttyler enrollment: **MENG 3211.053:** Monday 10:10 AM - 11:00 AM **Lab:** MENG 3211.**059L:** Friday 10:00 AM - 12:45 PM **Lab:** MENG 3211.**060L:** Friday 2:00 PM - 4:45 PM **Lab:** MENG 3211.**061L:** Monday 2:00 PM - 4:45 PM
Office Hours	**Tuesday:** 2:00 pm – 4:00 pm **Friday:** 1:00 pm - 2:00 pm or by appointment
Credit Hours	2 (1 hour lecture and 3 hours laboratory per week)
Required Textbook	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, 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 Rules and requirements	- Handouts and manuals posted on Canvas. Software available through virtual desktop – (https://vdi.uttyler.edu) and IT support. - AI is permitted only for specific assignments or situations, and appropriate acknowledgment is required. - It is NOT permitted to use AI for solving homework, quiz, or exam questions unless explicit written approval is given in the assignment instructions. However, it is permitted to ask AI chatbots general questions about how to solve certain types of problems if the chatbot is not providing the solution. - Since the mechanical engineering program is designed to prepare students for professional practice, all submitted work (e.g., homework, lab reports, projects, presentations) is expected to meet professional standards. Work that does not reflect professional quality may be subject to grade reductions, even if professionalism is not explicitly listed in the grading rubric.
Evaluation Method	Grading: Mid-term Exam **20** % Laboratory Reports **35** % Project **20** % Assignments and Quizzes **25** %
Grading Policy / Scale	Letter grades, scale: **A**: 90 – 100; **B**: 80 – 89; **C**: 70 – 79; **D**: 60 – 69; **F**: < 60 **Grade appeal** Grades can be appealed by sending an email then meeting the instructor during office hours, but no later than three days after the grade has been posted. Moreover, students may appeal any grade reduction to the instructor if valid excuse with documentation is provided.
Important events/ dates	**Census date:** January 26 **Last day to withdraw:** March 30 **Midterm Exam:** March 2 **Project due:** April 27 https://www.uttyler.edu/academics/academic-calendar-25-26/final-exam-schedule.php
Attendance/ Makeup policy/ other rules	1. Attendance is expected per university policy. Regular attendance is highly recommended whenever we have an in-person or zoom meeting. It is imperative if you want to do well in this course.

	2. Lab attendance is required. Failure in attending a lab will result in a zero grade in the corresponding lab report. 3. Attendance will be taken and regularly checked using Canvas. Students who come to class after attendance is taken will be considered absent. 4. In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made in the class. 5. Students will not be permitted to leave the classroom during lectures/labs except for extreme emergencies. 6. No email submission of assignments, HomeWorks, etc. All assignments MUST be submitted to Canvas for grading. 7. No makeups unless students provide a university accepted excused absence with proper documentation at the discretion of the instructor. 8. A student missing a laboratory activity by 10 minutes or more (e.g. arrive at 2:10:01 pm instead of at 2:00:00 pm) will have zero in the laboratory assignment. 9. Questions involving knowledge covered in class (lecture/laboratory) will be answered if the student proves that they have tried to come up with the answer. Solution to homework will not be given. However, students can work on the right solution by checking their work with the instructor. 10. Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements. 11. Any minor violation of the Student Behavior (see below) or the Lab Safety rules (see Canvas) by a student as deemed by the instructor will result in a full letter grade 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. 12. The use of cellular phones during lectures and labs is prohibited. If a student uses the cellular phone (call, text, internet), he/she will be asked to leave the classroom and penalties of missing the class will apply. It is highly recommended to keep your cellular phone off. 13. No food is allowed in the classroom or laboratories. 14. Instructions on the written and oral report format/style, grading rubric and peer evaluation forms will be given separately on Canvas. Late submissions of assignments, lab reports (e.g. if due at 11:59:00 pm, then any time after such as 11:59:30 pm is late) will result in **20 % deduction per day** from the graded score. 15. Given this is a professional, educational setting you are expected to dress and behave appropriately. A positive, mature attitude/behavior is expected from the students in all classes (lectures and laboratories). Students disturbing directly or indirectly the class or other students will be asked to leave the classroom or laboratory with the consequences associated to an absence.

	16. Students are encouraged to utilize any tutoring services available if needed and come prepared to each week's class and lab. Each student is expected to work with the group in a professional manner. It is important to communicate clearly and professionally of any concerns or issues to the instructor or lab assistant, who will relay to the instructor if they cannot be resolved independently. 17. Canvas should be the primary mode of contacting the instructor so check the Canvas announcements and discussion board to check for information about the course. In addition, university provided patriots email should be the official communication method and you should check your email regularly. Use the above email address or Canvas messaging if you want to email the instructor. Please use **MENG 3211- your section, your question or concern title** in the email subject line. Please allow the instructor at least one to two business days to respond to your email. Emails with improper language will not be answered. Emails with same concerns or questions from multiple students will be answered/covered during class time. 18. The syllabus is subject to change during the semester as deemed necessary. Students will be notified for any major changes.
Course Learning Objectives / ABET & PEOs relation	**Expected Learning Outcomes** By the end of this course students will be able to: 1. Apply fluid mechanics concepts for analysis of basic fluid mechanics experiments. 2. Apply heat transfer concepts for analysis of basic heat exchangers configurations. 3. Apply thermal system concepts for analysis of refrigeration and heat pump cycles, and psychrometrics processes. 4. Design, perform, and report results of a mechanical engineering experiment. 5. Write professional quality laboratory reports.
Tentative Topics	• Fluid mechanics laboratory procedures and devices, analysis and operation. • Basic heat exchangers, analysis and operation. • Basic psychrometrics • Self-directed laboratory investigation
University Policies	https://www.uttyler.edu/offices/academic-affairs/files/syllabus-information-rev122025.pdf
Evaluation activities	• **Exams**: there will be one exam during the semester. Late or no submission for the exam results in automatic grade of zero. • **Assignments**: Assignment include but not limited to pre-lab reports, in-class activities, MathCad assignment and MATLAB homework. Most

	assignments need to be completed before each lab, in which the content may be covered. • **Class Participation and Attendance**: Attendance is expected to lecture and mandatory to laboratory; taking notes and participating in discussions and class activities are required while in class. • **Lab Reports**: For each laboratory activity, a report must be submitted for grading on Canvas. Instructions on lab report format/style and grading rubric will be given separately. In addition, each lab report should include a **list/table of group members, individual tasks, and hours spent** as the **first appendix** in your reports (this applies to the project report as well). Peer Evaluation will have to be completed for couple selected lab reports if not all as well. • **Project Report**: Each student, part of a group, will work on one project of a topic approved by the instructor. The default project will be given separately. Students working in groups must propose the concept, demonstrate the experiment, and show the results of the project and finally discuss them.

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Tentative Course Schedule

#	Week of	Lecture Activity	Lab Activity
1	Jan. 12	Syllabus/ Introduction	**Lab A** - Lab Safety
2	Jan. 19	No Class (Martin Luther King, Jr. Day)	No Class (Martin Luther King, Jr. Day)
3	Jan. 26	Uncertainty Analysis	**Lab B** - Uncertainty Analysis using MathCad
4	Feb. 2	Major Losses in Pipes	**Lab C** - Project expectations and instructions
5	Feb. 9	Minor Losses in Pipes	**Lab 1** - Losses in Pipes
6	Feb. 16	Flow Meters/Venturi Flow	**Lab 2** - Venturi Flow
7	Feb. 23	Flow through an Orifice	**Lab 3** - Flow through an orifice
8	Mar. 2	Exam	Work on Project
9	Mar. 9	**Spring break – No Classes**	
10	Mar. 16	Psychrometrics/ Refrigeration and Heat Pump Cycles	Preliminary Project Report due
11	Mar. 23	Heat Exchangers I	**Lab 4** - Psychrometrics
12	Mar. 30	Heat Exchangers II	**Lab 5** - Heat Exchangers I
13	Apr. 6	Heat Exchangers III	**Lab 6** - Heat Exchangers II
14	Apr. 13	Supplemental topic	Work on Project
15	Apr. 20	Supplemental topic	Project - Presentations
16	Apr. 27	**Final Exam Week**/ Project Reports Due	