

MENG 3211 – Mechanical Engineering Lab II
Department of Mechanical Engineering, College of Engineering
The University of Texas at Tyler
Spring 2021 Semester – Sections 001, 001L, 002L

Instructor

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Office Hours: Mo 2 – 3 pm; Tu 9 – 10 am; Fr 11 am – 12 pm; or by appointment.

Course Details

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.

Credit hours: 2 (1 hour lecture and 3 hours laboratory per week).

Prerequisites: MENG 3210, MENG 3401, and MENG/CENG 3310.

Class Meeting: Lectures: Monday 8:00 – 8:55 am, Room COB 212
Lab for 001L: Wednesday 2:00 – 4:45 pm, Room RBN 1035
Lab for 002L: Friday 8:00 – 10:45 pm, Room RBN 1035
Synchronous Zoom Meeting ID: 913 9760 6750 (Passcode 3211)

Textbook: No textbook is required, but the books used in MENG 3210 and MENG 3310 are suggested.

Additional material: handouts, operating manuals, and material posted on CANVAS.

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.
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.

Evaluation activities

- Exams: there will be two exams during the semester, the Mid-Term Exam and the Final Exam. The final exam will be comprehensive.
- Lab Assignments: for each laboratory activity, the given assignment must be submitted at the beginning of the following laboratory class. Instructions for the presentation of the assignment (report or data analysis or other) will be given separately.

- Quizzes: quizzes will be applied according with the topics covered in lectures and lab activities. Homework related to a quiz may be assigned one week before the quiz. When homework is assigned, it must be 100% completed and turned in with the quiz. If the homework is not turned in or is incomplete, the quiz grade will be zero.
- Student Design Lab Project: students will work in a design lab project of a topic assigned by the instructor. Students must plan the experiment, build the experimental setup, conduct the experiment, obtain data, validate the results, submit a report, and present the project to the class. Although the project will be completed in groups, the grade will be individual based on contributions.

Grading

Mid-Term Exam	20%	<u>Scale:</u> A	90 – 100
Final Exam	20%	B	80 – 89
Lab Assignments	20%	C	70 – 79
Quizzes and Class Participation	20%	D	60 – 69
Student Design Lab Project	20%	F	< 60

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.

Attendance

Attendance to lecture classes is not mandatory but is strongly recommended. No options for makeup.

Attendance to laboratory classes is mandatory. A student missing a laboratory activity will have a zero for the laboratory assignment (report or data analysis or other) and must work in a makeup assignment to avoid 10 points being dropped in the midterm or final exam.

Changes to Syllabus and Course Schedule

I reserve the right to make changes to the syllabus or course schedule during the semester. Any change will be announced in class, and an updated version of the syllabus or course schedule will be posted to CANVAS.

Student Behavior

- Academic dishonesty, in the form of cheating, fabrication, falsification, multiple submissions, plagiarism, and complicity, will not be tolerated. Regulations about academic dishonesty are contained in *A Student Guide to Conduct and Discipline at UT Tyler*, which may be obtained from the Office of Student Affairs.
- The use of cellular phones during the class is prohibited (it is recommended to keep it off).

Additional Class/Instructor Policies

Quiz Not Taken:

There are no make-up quizzes. However, the lowest grade under “Quizzes and Class Participation” will be dropped to compute the average.

Homework

Homework will not be graded, but it is required to take the quiz. Students are advised that if a question in a quiz is similar to a question in the homework, maximum partial credit will be 50 points. However, if the quiz is the same as the homework, no partial credit will be given.

Pop Quizzes:

To ensure that the students review any material given by the instructor prior the laboratory, pop quizzes can be applied.

Assignments Due Date:

Unless otherwise stated, all assignments are due one week after been assigned.

Homework/Quiz/Report Questions:

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.

Homework/Quiz Solutions:

Solution to homework and quizzes will not be given. However, students can work on the right solution by checking their work with the instructor.

Student Attitude:

A positive attitude/behavior is expected from the students in all classes (lectures and laboratories). Students directly or indirectly disturbing the class or other students will be asked to leave the classroom or laboratory with the consequences associated to an absence.

Lab Reports:

The “Technical Report Writing Guide for Students in Mechanical Engineering” found on CANVAS is part of the Syllabus.

Modifications:

The instructor reserves the right to change this syllabus partially or fully at any point in time. Sufficient time and notice will be provided to the class before the activation of the changes.

University Policies:

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Student Standards of Academic Conduct

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, or material which has been submitted within a different course without explicit approval of the instructor, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. “Cheating” includes, but is not limited to:

- copying from another student’s test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials, or devices and instruments allowing access to materials, which are not authorized by the person giving the test, such as class notes or specifically designed “crib notes” as well as cell phones, to name a few. The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;

- collaborating with or seeking aid from another student or person during a test or other assignment without explicit authorization;
 - discussing the contents of an examination with another student who will take the examination;
 - divulging the contents of an examination, for the purpose of preserving questions for use by another, or removing material from the exam location, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
 - substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
 - paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
 - falsifying research data, laboratory reports, and/or other academic work offered for credit;
 - taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
 - misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
- ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
 - iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
 - iv. All written work that is submitted will be subject to review by plagiarism software.
 - v. Penalty for any related infractions will be decided at the discretion of the instructor including, but not limited to, granting of a failing grade in part or the course or in the entire course.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>

Important Covid-19 Information for Classrooms and Laboratories

Students are required to wear face masks covering their nose and mouth, and follow social distancing guidelines, at all times in public settings (including classrooms and laboratories), as specified by [Procedures for Fall 2020 Return to Normal Operations](#). The UT Tyler community of Patriots views adoption of these practices consistent with its [Honor Code](#) and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home and may join the class remotely. Students who have difficulty adhering to the Covid-19 safety policies for health reasons are also encouraged to join the class remotely. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors.

Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless

tobacco, snuff, chewing tobacco, and all other tobacco products.

There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support.

For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student

Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)

MENG 3211 - Class Schedule

Day	Date	Lecture Activity
Mo	Jan 11	Course Introduction
Mo	18	Review on Uncertainty
Mo	25	Flow Meters
Mo	Feb 1	Flow through an Orifice
Mo	8	Losses in Pipes I
Mo	15	Losses in Pipes II
Mo	22	Impact of a Jet
Mo	Mar 1	<u>Midterm Exam</u>
Mo	8	Spring Break - No Class
Mo	15	Heat Exchangers
Mo	22	Hydronic Systems
Mo	29	Psychrometrics
Mo	Apr 5	Refrigeration and Heat Pump Cycles
Mo	12	Supplementary Topic
Mo	19	Review for final exam
		<u>Final Exam</u>

Day	Date	Laboratory Activity
We	Jan 13	Lab Introduction
Fr	15	
We	20	MathCad for Uncertainty Analysis
Fr	22	
We	27	Flow meters
Fr	29	
We	Feb 3	Flow through an orifice
Fr	5	
We	10	Losses in Pipes I
Fr	12	
We	17	Losses in Pipes II
Fr	19	
We	24	Impact of a Jet
Fr	26	
We	Mar 3	Student Design Lab Project
Fr	5	
We	10	Spring Break - No Class
Fr	12	
We	17	Heat Exchangers
Fr	19	
We	24	Heat Exchangers - Hydronic Systems
Fr	26	
We	31	Student Design Lab Project
Fr	Apr 2	
We	7	Refrigeration and Heat Pump Cycles
Fr	9	
We	14	Validation of Project
Fr	16	
We	21	Presentations of Student Design Lab Project
Fr	23	