

**MEEN 3240****MEE Lab I****Fall 2025**

**Instructor:** Chakra Chand  
**Email:** [chakra.chand@unt.edu](mailto:chakra.chand@unt.edu)

**Office:** NTDP F180

**Office Hours:** By appointment

**Lecture Time/Location:**  
 Friday 9:00 a.m.-9:50 a.m. (50 minutes); Room E265

**Lab Location: F158; Lab TA:** Raad Haque: [RaadHaque@my.unt.edu](mailto:RaadHaque@my.unt.edu) (Major TA for this Course)  
 Athira Nair Ayyappankutty: [AthiraNairAyyappankutty@my.unt.edu](mailto:AthiraNairAyyappankutty@my.unt.edu)

**Lab Sessions**

- (1) Tuesday 12:30 p.m.-03:20 p.m.
- (2) Thursday 02:30 p.m.-05:20 p.m.
- (3) Friday 02:30 p.m.-05:20 p.m.

**Required Course Material:** Lab Manual & PPT Slides, which will be uploaded to Canvas one by one

**Reference Textbook:** Experimental Methods for Engineers, 8<sup>th</sup> ed (or 7<sup>th</sup> ed)  
 J. P. Holman (ISBN: 978-0-07-352930-1)

**Course Description**

This course is tailored for third-year Mechanical and Energy Engineering students to develop fundamental experimental skills in thermal-fluid sciences. It provides hands-on training in engineering measurements, data acquisition, and system analysis with an emphasis on accuracy, safety, and technical reporting.

Students will gain practical experience through a series of structured lab modules covering:

- Measurement techniques and uncertainty analysis
- Thermodynamic and heat transfer systems
- Fluid mechanics and viscosity measurements
- LabVIEW and data acquisition systems
- Calorimetry and refrigeration cycles
- HVAC system performance analysis
- Student-designed experimental projects

**Pre-requisites:** MEEN 2210; MATH 3410; MEEN 2110;

MEEN 3240 Course Learning Outcomes	ABET EAC Student Outcomes						
	1	2	3	4	5	6	7
Demonstrate ability to perform statistical error analysis of experimental data.	X					X	
Demonstrate understanding measurements of transport properties.	X					X	
Demonstrate understanding of temperature measurements.	X					X	
Demonstrate understanding basic electrical measurement.	X					X	
Demonstrate ability to design and conduct mechanical engineering experiments.	X					X	
Demonstrate understanding of concepts of the First Law of Thermodynamics.	X					X	
Demonstrate understanding fundamentals of energy and power estimation for both solar and wind.	X					X	
Demonstrate ability to present and report scientific data.			X	X	X	X	
Demonstrate ability to control thermal science experiments.						X	

## Grades:

Lab Reports (9)	45%	> 90%	A
Lecture + Lab Attendance (10) (5+5 = 10)%		80-89.9%	B
Midterm (Lectures 1-4 and Experiments 1-4)	20%	70-79.9%	C
Final Exam (Lectures 5-9 and Experiments 5-9)	20%	60- 69.9%	D
<u>Lab 10-Student Designed Experiment</u>	<u>5%</u>	< 60%	F
Total	100%		

**Reports:** Upload in your scanned lab reports into **Canvas in pdf format**. **NO late lab reports will be collected.**

**Due days for lab reports (Definition of “late” lab reports):** Unless otherwise stated, lab reports are due *exactly one week* after your lab session. For example, if your group’s lab session is on Tuesday from 12:30 p.m. to 1:55 p.m., you are expected to perform your experiment during that time every Tuesday. Accordingly, your lab report will be due by 12:30 p.m. the following Tuesday, before the start of your next lab session.

Any report uploaded after 12:30 p.m. on Tuesday will be considered late and will not be graded.

### Lecture attendance:

**Lecture attendance is mandatory;** an attendance sheet will be provided, and students’ signatures will be collected for each individual lecture. **Lecture attendance will contribute 5% to your final grade.**

### Lab attendance:

**Lab attendance is mandatory.** Attendance will contribute **5%** to your final grade. An attendance sheet will be circulated during each lab session, and all students are required to sign in individually. Additionally, a group or individual photograph must be taken in front of the experimental setup on the day of the lab. This photo must be included in your lab report as part of the documentation. Failure to submit the required photo will result in a point deduction as outlined in the grading rubric.

### Exam:

- (1) **Exam Policy:** All exams are strictly **closed book and closed notes**.
  - (2) **Formula Sheet:** A standardized **formula sheet will be provided** along with the exam question paper.
  - (3) **Content of Formula Sheet:** The sheet will include essential equations, property data, and constant values required for solving the exam questions.
  - (4) **Academic Integrity:** Any student found violating this policy (e.g., bringing unauthorized material or using personal notes or formula sheets) **will receive a zero** for the exam, and the **incident will be reported** to the department and the university for further disciplinary action.
- (5) **There will be NO make-up exam.** Exceptions: UNT Policies 06.039

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An absence may be excused for the following reasons:

- ❖ religious holy day, including travel for that purpose;
- ❖ active military service, including travel for that purpose;
- ❖ participation in an official university function;
- ❖ illness or other extenuating circumstances;
- ❖ pregnancy and parenting under Title IX; and
- ❖ when the University is officially closed.

**Procedure: Please request accommodations/exceptions through UNT “Dean of Students Office”**

**Calculator Policy:**

The use of a calculator is required and allowed on all homework, exams and quizzes. Calculators with graphing capabilities will be allowed in the course for homework and quizzes. However, only calculators currently allowed in the Fundamentals of Engineering (FE) and Professional Engineering (PE) exams will be allowed in ALL EXAMS (Exam #1, Exam #2 and Exam #3/final exam). NO other calculators will be approved for exams. Please refer to the National Council of Examiners for Engineering and Surveying (NCEES) calculator policy for the list of acceptable calculators.

Casio: All fx-115 and fx-991 models (Any Casio calculator must have “fx-115” or “fx-991” in its model name.)

Hewlett Packard: The HP 33s and HP 35s models, but no others

Texas Instruments: All TI-30X and TI-36X models (Any Texas Instruments calculator must have “TI-30X” or “TI-36X” in its model name.)

**Disability Accommodations:** If you need academic accommodations for disability you must have document which verifies the disability and makes you eligible for accommodations, then you can schedule an appointment with the instructor to make appropriate arrangements.

**Academic Dishonesty:**

There is a zero tolerance policy. Cheating of whatsoever will result in an automatic ‘F’ in this course and the matter will be turned over to the appropriate student disciplinary committee.

**MEEN 3240 MEE Lab I**  
Schedule Overview (Subject to change)

Week	Dates	Lecture Topics	Lab Session/Activity	Reports Due
W1	Aug.18 – Aug.22	Overview of Syllabus and Safety Rules	NO Lab Sessions	---
W2	Aug.25 – Aug.29	Lecture 1: Measurement & Uncertainty	NO Lab Sessions	---
W3	Sep.01 – Sep.05	Lecture 2: Measurement of air viscosity	Experiment #1: Measuring density of THREE different objects	---
W4	Sep.08 – Sep.12	Lecture 3: Measurement of Liquid Viscosity	Experiment #2: Measurement of air viscosity	Exp. #1
W5	Sep.15 – Sep.19	Lecture 4: Thermocouple Construction and Calibration	Experiment #3: Measurement of Liquid Viscosity Using Different Viscometers	Exp. #2
W6	Sep.22 – Sep.26	Lecture 5: Calorimetry Laboratory#1: Specific heat of metals	Experiment #4: Thermocouple Construction and Calibration	Exp. #3
W7	Sep.29 – Oct.03	Review Lecture: Midterm Exam Review	Experiment #5: Measurement of the specific heat of Different Metals	Exp. #4
W8	Oct.06 – Oct.10	<b>Midterm Exam</b> (coverage: Lecture 1-4 and Experiments 1-4)	NO Experiment Entire Week	---
W9	Oct.13 – Oct.17	Lecture 6: Calorimetry Laboratory#2: Latent heat of Ice	NO Experiment Entire Week	---
W10	Oct.20 – Oct.24	Lecture 7 Rankine Cycle	Experiment #6: Measurement of the Latent heat of Ice	Exp. #5
W11	Oct.27 – Oct.31	Lecture 8: Refrigeration Cycle	Experiment #7: Rankine Cycle	Exp. #6
W12	Nov. 03 – Nov. 07	Lecture 9: HVAC system	Experiment #8 Refrigeration Cycle	Exp. #7
W13	Nov. 10 – Nov. 14	Lecture 10: Student Designed Experiment	Experiment #9 HVAC system	Exp. #8
W14	Nov. 17 – Nov. 21	Review Lecture Final Exam Review	Experiment #10 Student Designed Experiment	Exp. #9
W15	Nov. 24 – Nov. 28	No Lecture on Friday. Thanksgiving Break. UNT Closed	NO Experiment Entire Week	----
W16	Dec.01 – Dec. 05	<b>Final Exam (using lecture time)</b> (coverage: Lecture 5-9 and Experiments 5-9)	NO Experiment Entire Week	Exp. #10
W17	Dec.08 – Dec. 12	----	----	----