

MEEN 3240.001**MEE Lab I****Spring 2015**

Instructor: Xiaohua Li **Office:** NTDP F101G
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Office Hours: Open Office Policy. Tu/TH/F, 9:00 a.m.-11:00 a.m.

Lecture Time/Location: Monday 8:30 a.m.-9:20 a.m.; room D201

Lab Location: F158

Lab Sessions

- (1) Tuesday 9:30 a.m.-12:20 p.m. (group #1: 9:30 a.m.-10:50 a.m.; group #2: 11:00 a.m.-12:20 p.m.)
(2) Wednesday 12:30 p.m.-3:20 p.m. (group #3: 12:30 p.m.-1:50 p.m.; group #4: 2:00 p.m.-3:20 p.m.)
(3) Wednesday 3:30 p.m.-6:20 p.m. (group #5: 3:30 p.m.-4:50 p.m.; group #6: 5:00 p.m.-6:20 p.m.)
(4) Thursday 11:00 a.m.-1:50 p.m. (group #7: 11:00 a.m.-12:20 p.m.; group #8: 12:30 p.m.-1:50 p.m.)
(5) Thursday 2:00 p.m.-4:50 p.m. (group #9: 2:00 p.m.-3:20 p.m.; group #10: 3:30 p.m.-4:50 p.m.)

Lab Manual: will be uploaded to Blackboard one by one

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

Course Description:

This course is designed for third-year mechanical and energy engineering students to enable mastery of basic experimental skills in the thermal-fluid sciences. Students are expected to demonstrate capability of performing various levels of engineering measurements with reasonable accuracy.

The lab course covers the following topics:

Category I: Basic knowledge in measurements and data analysis

Category II: Thermodynamics and heat transfer

Category III: Fluid mechanics

Category IV: Renewable Energy

Pre-requisites: MEEN 2210 Thermodynamics I

Course Learning Outcomes (CLO):

Upon successful completion of this course, students will be able to:

- (1) Ability to perform statistical error analysis of experimental data
- (2) Understanding measurements of transport properties
- (3) Understanding temperature measurements
- (4) Ability to design and construct mechanical engineering experiment
- (5) Understanding basic electrical measurement techniques
- (6) Concepts of the First Law of Thermodynamics
- (7) Understanding fundamental of wind energy and wind power estimation
- (8) Ability to present and report scientific data
- (9) Ability to control thermal science experiments

ABET Student Learning Outcomes (SO)

- a. Ability to apply mathematics, science and engineering principles.
- b. Ability to design and conduct experiments, analyze and interpret data.
- c. Ability to design a system, component, or process to meet desired needs.
- d. Ability to function on multidisciplinary teams.
- e. Ability to identify, formulate and solve engineering problems.
- f. Understanding of professional and ethical responsibility.
- g. Ability to communicate effectively.
- h. The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- i. Recognition of the need for and an ability to engage in life-long learning.
- j. Knowledge of contemporary issues.
- k. Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

CLO	ABET Student Outcomes (SO)										
	SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8	SO9	SO10	SO11
1	x	x									
2	x	x			x						x
3		x			x						
4		x									x
5		x			x					x	x
6	x	x			x						
7		x			x						
8							x				
9					x						x

Grades: Lab Reports (9)	50%	$\geq 90\%$	A
Lecture Attendance (10)	10%	80-89.9%	B
Midterm (Lectures 1-6 and Experiments 1-5)	20%	70-79.9%	C
<u>Final (Lectures 7-10 and Experiments 6-9)</u>	<u>20%</u>	60- 69.9%	D
Total	100%	< 60%	F

Reports: Please turn in your group reports in **electronic format (reports should be in PDF format and emailed to instructor: Xiaohua.li@unt.edu)** on the due day before your lab session starts. **Please use key words like “MEEN 3240 Lab I, Group #5, lab report #7”.** **NO late lab reports will be collected.**

A **Template** for lab report in MS Word format has been posted in Blackboard. **Download and use the template DIRECTLY. Convert your report to PDF before submitting.**

Due days for lab reports (Definition of “late” lab reports): if not otherwise stated, lab reports due EXACT one week after your lab session. For example, if your group lab session is Tuesday, 9:30 a.m.-10:50 a.m. (this is the first group on Tuesday morning lab session 9:30 a.m.-12:20 p.m.), this means you will do your experiment on every Tuesday 9:30 a.m.-10:50 a.m. Therefore, your lab report will due next Tuesday 9:30 a.m., before the new experiment starts. In this case, lab report turned in after 9:30 a.m. Tuesday will be considered as “late” and will not be collected.

Lecture attendance:

Lecture attendance is mandatory; attendance sheet will be provided and collected for each individual lecture. Lecture attendance will contribute 10% to your final grade.

Lab attendance:

Lab attendance is mandatory; a group picture in front of the lab equipment on the experiment day is required. This group picture should be included in your lab report and will be used to check the lab attendance. Lab attendance will be incorporated in your peer evaluation score.

Teamwork:

Each group should consist of maximum 5 students. Once the group is formed, students will have to stay in the same group and may NOT change group for the entire semester. By definition, a group must have more than one individual. Anyone unwilling or unable to work in a group with multiple other individuals will receive an ‘F’ in MEEN 3240. **Reports submitted by individuals will not be graded.**

Peer Evaluation: A peer evaluation will be performed for any individual experiment if any group member requests such a peer evaluation. Each group member will evaluate the **lab performances** and **report contributions** of other members in the same group anonymously by a scale of 0-100%. 100% means a good job on the assigned part of work while 0% means totally no contribution to the lab and the report. Results of peer evaluation should be sealed in an envelope and turned in to the instructor or TA. The **(average percentage)* (group experiment report score)** will be the score of that particular student for that particular lab report.

For example, we assign max 100 points for each lab report, and the score for one group report is 94; Suppose one student received an average peer evaluation of 50%, then this individual student will receive a credit of $94 \times 50\% = 47$ points for that particular lab report.

Exam:

- (1) **Exams are closed book closed notes with formula sheets.**
- (2) Formula sheets can be maximum 5 pages, A4 or letter size, both sides
- (3) Each student is responsible for preparing his/her own formula sheets.
- (4) Formula sheets could include anything BUT: data or data analysis from lab reports or experimental manual. Student who failed to follow this rule will score zero in the exam and this cheating matter will be reported to the department and university.
- (5) Formula sheets must be turned in with the exam papers (in the case of formula sheets were not checked by the instructor during the exam). Student who failed to follow this rule will score zero in the exam and this cheating matter will be reported to the department and university.
- (6) **There will be NO make-up exam.** Exceptions: medical emergence (student and important ones), transportation/traffic emergency; religious holidays/duty, jury duty and military duty. **Documentary evidence must be submitted.**

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.

IMPORTANT EXAM DATES

Midterm (Lectures 1-5 and Experiments 1-4):

March 9th 2015 Monday 8:30 a.m.-9:20 a.m.; room D201

Final (non-Comprehensive, Lectures 6-10 and Experiments 5-9):

April 29th 2015 Wednesday, 8:30 a.m.-9:20 a.m.; room D201

MEEN 3240.001 MEE Lab I
Schedule Overview (Subject to change)

Week	Dates	Lecture Topics	Lab Session/Activity	Reports Due
#1	Jan. 19 th - Jan. 23 th	MLK day (Monday), NO LECTURE	NO Experiment	--
#2	Jan. 26 th - Jan. 30 th	Overview of syllabus; Team up; Safety Training	Team up in lab F158 Meet your TA and group members; collect TA/group member contact information	--
#3	Feb. 2 nd - Feb. 6 th	Lecture 1: Measurement & Uncertainty	NO Experiment	--
#4	Feb. 9 th - Feb. 13 th	Lecture 2: Measuring Properties of unknown Materials; Uncertainty Propagation	Experiment #1: Measuring density of THREE different objects	--
#5	Feb. 16 th - Feb. 20 th	Lecture 3: Measurement of air viscosity	Experiment #2: Measurement of air viscosity	Exp. #1
#6	Feb. 23 rd - Feb. 27 th	Lecture 4: Stokes' Law and Reynolds number	Experiment #3: Stokes' Law and Reynolds number	Exp. #2
#7	Mar. 2 nd - Mar. 6 th	Lecture 5: Measurement of Liquid Viscosity	Experiment #4: Measurement of Liquid Viscosity Using Rotational Viscometer	Exp. #3
#8	Mar. 9 th - Mar. 13 th	March. 9th Monday Midterm Exam: (coverage: Lecture 1-5 and Experiments 1-4)	No Experiment	Exp. #4
#9	Mar. 16 th - Mar. 20 th	Spring Break. NO Lecture	No Experiment	Exp. #5
#10	Mar. 23 rd - Mar. 27 th	Lecture 6: Thermocouple Construction and Calibration	Experiment #5: Thermocouple Construction and Calibration	---
#11	Mar. 30 th - April 3 rd	Lecture 7: Calibration of Resistance Temperature Detector and Thermistor	Experiment #6: Calibration of Resistance Temperature Detector and Thermistor	--
#12	April 6 th - April 10 th	Lecture 8: Calorimetry Laboratory I	Experiment #7: Measurement of the specific heat	Exp. #6
#13	April 13 th - April 17 th	Lecture 9: Calorimetry Laboratory II	Experiment #8: Measurement of the Latent Heat of Ice	Exp. #7
#14	April 20 th - April 24 th	Lecture 10: Renewable Energy: Wind Power Estimate	Experiment #9: Wind Power Estimate	Exp. #8
#15	April 27 th - May 1 st	Lecture 11: Final Review	No Lab/Experiment Lab Report #9 due as usual	Exp. #9
#16	May 2 nd - May 6 th	May 4th Monday; 8:30 -9:20 am Final Exam (coverage: Lecture 6-10 and Experiments 6-9)	No Experiment ; NO lab reports Due	--

Document History: Dr. Xiaohua Li, Created on 01/14/2014; updated on: 1/22/2015

SPRING 2015

Date	Event
January 19, 2015	MLK Day (no classes; university closed)
January 20, 2015	First Class Day
March 16-22, 2015	Spring Break (no classes)
May 2-8, 2015	Pre-finals Week
May 7, 2015	Last Class Day
May 8, 2015	Reading Day (no classes)
May 9-15, 2015	Finals
May 15, 2015	Doctoral and Master's Commencement
May 15-16, 2015	Undergraduate Commencement

Link for Spring 2015 Final Exams - Discovery Park
<http://registrar.unt.edu/exams/final-exam-schedule/spring>

Saturday, May 9	
<i>This class...</i>	<i>Has a final exam at this time...</i>
All Saturday classes & All INET Classes with On Campus Finals	Contact Department
MWF 10:30 a.m.	8:30 a.m. - 10:30 a.m.
MWF 1:30 p.m.	11:00 a.m. - 1:00 p.m.
F 2:30 p.m. - 5:20 p.m.	2:00 p.m. - 4:00 p.m.
MWF 4:30 p.m.	2:00 p.m. - 4:00 p.m.
Monday, May 11	
<i>This class...</i>	<i>Has a final exam at this time...</i>
MWF 8:30 a.m.	8:30 a.m. - 10:30 a.m.
MWF 11:30 a.m.	11:00 a.m. - 1:00 p.m.
MWF 2:30 p.m.	2:00 p.m. - 4:00 p.m.
MW 2:30 p.m. - 3:50 p.m.	2:00 p.m. - 4:00 p.m.
M 2:30 - 5:20 p.m.	2:00 p.m. - 4:00 p.m.
Tuesday, May 12	
<i>This class...</i>	<i>Has a final exam at this time...</i>
TR 8:30 a.m.	8:30 a.m. - 10:30 a.m.
TR 11:30 a.m.	11:00 a.m. - 1:00 p.m.
TR 2:30 p.m.	2:00 p.m. - 4:00 p.m.
T 2:30 p.m. - 5:20 p.m.	2:00 p.m. - 4:00 p.m. .
Wednesday, May 13	
<i>This class...</i>	<i>Has a final exam at this time...</i>
MWF 9:30 a.m.	8:30 a.m. - 10:30 a.m.
MWF 12:30 p.m.	11:00 a.m. - 1:00 p.m.
W 2:30 p.m. - 5:20 p.m.	2:00 p.m. - 4:00 p.m.
MWF 3:30 p.m.	2:00 p.m. - 4:00 p.m.
MW 4:00 p.m. - 5:20 p.m.	2:00 p.m. - 4:00 p.m.