

MEEM 3220 Energy Laboratory
Fall 2011

Course Description:

This course is designed to demonstrate the relation between theoretical knowledge and practical applications in the areas of thermodynamics and fluids mechanics. The experiments are closely related to real world applications. The intent of the course is to reinforce material covered in thermodynamics and fluid mechanics while providing “hands-on” experience on industrial equipment.

Course Requirements:

Pre-requisite: MEEM 2200 – Thermodynamics

Co-requisite: MEEM 3210 – Engineering Fluid Mechanics

Instructor:

Course Director: Mehdi Mortazavi

Office: 822 (MEEM)

Email: mortazav@mtu.edu

Phone: emails will go straight to phone

Office Hours: Monday 1-2pm,
Friday 3-4pm

Resources:

- **REQUIRED:** J. P. Holman, Experimental Methods for Engineers, McGraw-Hill
- **REQUIRED: NOTES:** <http://courses.mtu.edu>
- Frank M. White, Fluid Mechanics, 5th Ed., McGraw-Hill
- Munson, Young and Okiishi, Fundamentals of Fluid Mechanics, 5th Ed., John Wiley & Sons
- Michael J. Moran and Howard N. Shapiro, Fundamentals of Engineering Thermodynamics, 5th Ed., John Wiley and Sons, Inc.

Course Requirements:

- **Personal Eye Protection** is required. Failure to bring eye protection to class may result in a failed lab for the day.
- Students are expected to read the appropriate section of the lab manual **before** coming to lab.
- Pre-labs will be assigned prior to lab session.
- Pre-labs are due at the beginning of the lab session.
- With prior permission, students can make-up a missed lab.
- Experiment reports will be due before the next experiment.

- Mandatory attendance for all labs. Students may not switch sections without prior approval of the Course Director. Course Director may approve emergency absences.
- 4-6 hours of additional work outside of the laboratory is expected

Course Grading:

Lab Report	:	70%
Pre Labs	:	15%
Quizzes	:	15%

Grade:

A	90 - 100%
AB	85 - 89%
B	80 - 84%
BC	75 - 79%
C	70 - 74%
CD	65 - 69%
D	60 - 64%
F	Below 60%

Late Policy:

• **Pre-labs**

- No credit will be given for late assignments without prior permission.

• **Lab Report**

- One day late:
 - First infraction: 20% deduction (maximum 80% grade)
 - Second infraction: 50% deduction (maximum 50% grade)
 - Third infraction: 100% deduction (maximum 0% grade)
- Two days late:
 - First infraction: 50% deduction (maximum 50% grade)
 - Second infraction: 100% deduction (maximum 0% grade)

University Policies

Academic regulations and procedures are governed by University policy. Academic dishonesty cases will be handled in accordance with the University's policies.

If you have a disability that could affect your performance in this class or that requires an accommodation under the Americans with Disabilities Act, please see me as soon as possible so that we can make appropriate arrangements. The Affirmative Action Office has asked that you be made aware of the following:

Michigan Tech complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990. If you have a disability and need a reasonable accommodation for equal access to education or services at Michigan Tech, please call the Dean of Students Office, at 487-2212. For other concerns about discrimination, you may contact your advisor, department head or the Affirmative Action Office, at 487-3310

Academic Integrity:

http://www.studentaffairs.mtu.edu/dean/judicial/policies/academic_integrity.html

Affirmative Action:

<http://www.admin.mtu.edu/aao/>

Disability Services:

http://www.admin.mtu.edu/urel/studenthandbook/student_services.html#disability

Equal Opportunity Statement:

<http://www.admin.mtu.edu/admin/boc/policy/ch3/ch3p7.htm>

Course Schedule

Date	Week	Topic
Aug 30 - Sep 1	1	- Safety Rules, Report Guidelines, Unit Conversion Review - EES
Sep 6 - 8	2	- Uncertainty and Regression Analysis - Density
Sep 13 - 15	3	- Measures of Temperature
Sep 20 - 22	4	- Static Pressure
Sep 27 - 29	5	-NO CLASS - Career Fair
Oct 4 - 6	6	- Saturation Pressure
Oct 11 - 13	7	- Refrigeration Cycle
Oct 18 - 20	8	- Digital Data Acquisition (DAQ) - Dynamic Transducer Calibration
Oct 25 - 27	9	- Digital Data Processing - Polytropic Processes & P-V Work
Nov 1 - 3	10	- Measures of Air Flow
Nov 8 - 10	11	- HVAC
Nov 15 - 17	12	- Digital DAQ - Pipe Flow 1
Nov 22 - 24		-NO CLASS - Thanksgiving Break
Nov 29 - Dec 1	13	- Dimensional Analysis - Pipe Flow 2
Dec 6 - 8	14	-Make-Up Lab