Mechanics of Materials Lab

ME 354
University of Washington, Seattle — Winter Quarter 2009

Location: MEB 248 (Lecture)
MEB 127 (Lab)

Time: 9:30-10:20am MTWF (Lecture)
2:30-5:20pm TWThF (Lab)

Instructor: Nathan J. Sniadecki
MEB 318

Phone: 206.685.6591
e-mail: nsniadec@u.washington.edu

TAs: Lucas Ting lhting@u.washington.edu Lab: 2:30-5:20pm TTh
Xin Liang liangxin@u.washington.edu Lab: 2:30-5:20pm WF

Office Hours: NS: 10:30-11:30am TTh, MEB 318, or by appointment
LT: 1:30-2:30pm TF, MEB 127
XL: 1:30-2:30pm WTh, MEB 127

Website: `http://courses.washington.edu/nsniadec/ME354/W09`

Description: Properties and behavior of engineering materials including stress-strain relations, strength, deformation mechanisms, strength, deformation, fracture, creep, and cyclic fatigue. Introduces experimental techniques common to structural engineering, interpretation of experimental data, comparison of measurements to numerical/analytical predictions, and formal, engineering report writing. Lecture and laboratory.

Prerequisites: MSE 170 – Fundamentals of Material Science
CEE 220 – Introduction to Mechanics of Materials

Required Text:

[1] Dowling, N. E., 2007, *Mechanical Behavior of Materials: Engineering Methods for Deformation, Fracture, and Fatigue*, *3rd edition*, Pearson/Prentice Hall, Upper Saddle Ridge, NJ (ISBN: 0131863126)

Recommended Texts:

[2] Callister, W. D. 2007, *Materials Science and Engineering: An Introduction, 7th edition*, John Wiley & Sons, New York, NY

[3] Hibbeler, R.C., 2005, *Mechanics of Materials, 5th edition*, Pearson/Prentice Hall, Upper Saddle Ridge, NJ

[4] Taylor, J.R., 1997, *An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements*, University Science Books, Sausalito, CA

Grading:

1)	Reports	55%	Formal Reports 45%, In-lab Report 10%
2)	Exams	35%	Midterm Exam 15%, Final Exam 20%
3)	Homework	10%	
4)	Quizzes	+1%	Fundamentals of Engineering Exam Questions

Course Policies:

Homework Policy: All assignments must be handed in before class starts on the due date. Late homework will be excepted if and only if arrangements are made in advance of the due date. Grading for each problem will be given either full credit, partial credit, or zero credit depending on the correct answer and the amount of effort given to the problem. Homework must be formatted according to the requirements listed on the website in order to receive full credit.

Lab Report Policy: Late lab reports will not be accepted. All reports are to be turned into the TA of your section. Formal reports are due after week at the start of the next week's lab period. In-lab reports are due by the end of the lab period. Please cite any figures or material that you copied, reproduced, or rewrote in your own words.

Collaboration Policy: You may discuss lab reports and homework with your fellow students, and even collaborate on the solution, but you must list on the homework or report the name of the person(s) that collaborated with you on the effort.

Exam Policy: All exams must be completed on the specified date. Only under proven, extraordinary circumstances will a makeup exam be permitted. Engineering calculators are permitted.

Classroom Policy: Please consider the learning mission of the course and refrain from activity that is disruptive during the lectures or lab sessions.

I have a zero-tolerance for cheating or plagiarism. Please refer to UW's Student Conduct Code.
http://www.washington.edu/students/handbook/conduct.html

Course Outcomes and Assessment:

By the end of this course, the student will be able to:

1. List and explain applicable experimental methods for characterizing material and component behavior
2. Compare (and quantify differences) measured experimental results and calculated theoretical values.
3. Predict component behavior using experimental test results and engineering formulae
4. Analyze experimental data, theoretical models and their scalability to components
5. Analyze (deduce) the inherent variability of materials subjected to multiple modes of loading and apply the results to component behavior.
6. Formulate a solution path for analyzing an actual multi-component structure using experimental, theoretical, and numerical tools/methods.
7. Evaluate the limits of structures by extending the experimental measurements using theoretical and numerical methods

Contribution of Course to Professional Development:

The aim of the course is to prepare students for engineering practices by familiarizing them with mechanical testing systems, conducting experimental work, advancing their fundamental engineering knowledge, cultivating professional engineering standards, and developing their technical communication abilities.

Subject to Change Statement (a/k/a 'Living Syllabus'):

Information contained in the ME 354 course syllabus, other than the grade and course policies, may be subject to change, as deemed appropriate by the instructor. Advanced notice will be given during the lecture times and changes will be updated to the course website.