ME108: Mechanical Behavior of Engineering Materials
Course Syllabus – Fall 2015

Instructor:	Ayyana M. Chakravartula, Ph.D., P.E., ayyanac@berkeley.edu Office hours: M 1:00 PM – 2:00 PM, 5112 EH, or by appointment
GSIs:	Sayna Ebrahimi, sayna@berkeley.edu, OH T 2:00 PM – 3:00 PM, 1165 EH Jingyi Wang, jingtian@berkeley.edu, OH Th 3:00 PM – 4:00 PM, Location TBA Renxiao Xu, renxiaoxu@berkeley.edu, OH W 2:00 PM – 3:00 PM, Location TBA Additional GSI TBA
Lecture:	MWF 3:00 PM – 4:00 PM, 106 Stanley
Discussion:	T 6:00 PM – 7:00 PM, 150 GSPP OR Th 5:00 PM – 6:00 PM, 12 Haviland
Lab:	See Lab Syllabus

Course materials will be posted on bCourses (https://bcourses.berkeley.edu).

Course Summary: This course will cover the fundamentals of mechanical behavior of materials. The lecture topics are listed below. A laboratory will provide hands-on experience with running mechanical tests and analyzing and reporting data.

Prerequisites: ME C85 Introduction to Solid Mechanics

Required Textbooks:
Dowling, *Mechanical Behaviors of Materials*, 4th Edition, Prentice Hall, Upper Saddle River, NJ, 2012.
Komvopoulos, *Mechanical Testing of Engineering Materials*, Cognella Academic Publishing, San Diego, CA, 2010.

Required Materials:
Bound lab notebook (spiral-bound is acceptable, but must be dedicated to this course)
Safety glasses (ANSI Z87)

Optional References:
Callister & Rethwisch, *Materials Science and Engineering: An Introduction*, 9th Edition, Wiley, Hoboken, NJ, 2013.
Pruitt & Chakravartula, *Mechanics of Biomaterials*, Cambridge University Press, Cambridge, UK, 2011.

Grading:

Homework:	10%
Laboratory:	25%
Midterm Exam 1:	20%
Midterm Exam 2:	20%
Final Exam:	25%

Policies:
Homework assignments must be submitted at the *beginning of lecture* on the due date. Solutions will be posted on the course website. Late homework will not be accepted. Exams must be taken at the designated time; there will be no makeup exams except in the case of an unavoidable emergency or a university-mandated absence.* Arrangements must be made with the instructor prior to the exam.
Students are encouraged to share intellectual views and discuss the course material freely. However, any graded work *must be the product of independent effort* unless otherwise noted.
Exams are closed book, but a single formula sheet (front/back) will be allowed.
Lab reports are due at the beginning of lab on the due date. Labs 1-6 are group reports, Labs 7-8 are individually-written.

Important dates:
First week of lab: week of August 31
Midterm 1: October 14, in class
Midterm 2: November 23, in class
Final: December 15, 7:00 PM – 10:00 PM, Location TBA

* See information on acceptable absences on the following page

Lecture topics:

- Engineering materials failure
- Bonding and crystal structure of polymers, metals and ceramics
- Defects and dislocations
- Alloying, hardening and heat treatments
- Phase diagrams
- Mechanical testing
- Elastic behavior
- Multiaxial loading, complex stress states
- Time-dependent behavior
- Yield criteria
- Plastic deformation
- Fracture
- Fatigue
- Corrosion
- Friction, wear

Acceptable absences:
If you must miss class due to a reason covered in the Religious Creed section of the Academic Calendar webpage or due to an extracurricular activity, please submit a request in writing by the second week of the semester (September 9).

Academic Integrity:
Please be aware of the common forms of academic dishonesty, which are described in detail in Appendix II of the Student Code. These include (but are not limited to): cheating, plagiarism, false information and representation, and theft or damage of intellectual property. It is expected that the students in ME108 will hold themselves to the highest ethical standards. Academic dishonesty will not be tolerated, and consequences can range from lost credit for assignments to failing the class. Being reported to the University for disciplinary action may result in a permanent note in your academic record, visible to future employers and graduate programs.

Please take care when distinguishing between **working together** and **copying**. We encourage students to collaborate on problem sets, but each student is responsible for handing in his/her own work. Even if students work together on calculations, each student must hand in individual assignments comprised wholly of that student's own wording, ideas, and explanations. One student may explain concepts to another student, but no student should share files. If a student copies from another student, even without permission, it is impossible for us to determine who did the original work and both students will face punishment.