

Engineering 245 L  
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The laboratory section of the course has multiple purposes. One, the obvious, is familiarization with some of the more significant of the many phenomena encountered in the study course. Also, the laboratory section is a further education in scientific methods: planning, observation, measurement, data acquisition and reduction, drawing conclusions, and presenting results in the form of technical reports. Experiments will be somewhat open-ended, and described rather vaguely. Working together in the laboratory is not only recommended, but required.

Grading: One quarter of the Engineering 245 grade is based upon the laboratory grade. However, a passing grade in the course is contingent upon a passing laboratory grade. This will be determined from the total accumulated points on reports, quizzes and participation. The points will vary, depending upon experiments assigned.

Quizzes will be graded out of ten points possible. Reports will be graded out of 20 or 25 points. Each report must be an individual effort. Plagiarism or copying will result in a severe loss of credit. (Possibly an 'F' in the course).

Tentative schedule: The following schedule is intended to be flexible. Any changes will be announced as early as possible.

<u>Week</u>	<u>Experiment</u>	
1	Introduction. Methods, measurements. Reports	
2	Elastic and plastic deformation. Linear elastic modulus.	Report
3	Crystal lattice models Unit cells and lattice constants.	Report
4	Review of reports: grading, criteria. Measuring devices.	
6	Hardness and hardness testing.	Quiz
7	Tensile testing. Linear elastic modulus.	Quiz
8	Allotropic transformation of iron. Thermal expansion of iron.	Quiz
9	Brittle transformation of steels.	Quiz
11	Hardening, tempering, and annealing of steels.	Quiz
12	Cooling curves and phase diagrams.	Report
13	Recrystallization of cold worked brass.	Report
14	Hardenability of steels	Quiz
16	Corrosion. Electrochemistry and oxidation potentials.	