

California State University, Chico  
**MECH 210 - Materials Science and Engineering**  
Spring Semester 2008

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- Catalog Description:** Processing, structure, properties, and performance of engineering materials. Applied knowledge of material properties as engineering design parameters. Advanced manufacturing processes, including microfabrication, are discussed.
- Instructor:** Dr. C. H. Hsu, OCNL 415 Phone: 530.898.5374 e-mail: [chhsu@csuchico.edu](mailto:chhsu@csuchico.edu)  
Office Hours: MW 10:00–10:50 a.m., T 9:00–9:50 a.m.  
F 10:00 – 10:50 a.m., 2:00 – 2:50 p.m.
- Prerequisites:** PHYS 204A (Mechanics) and CHEM 111 (General Chemistry, may be taken concurrently)
- Textbook:** *Materials Science and Engineering-An Introduction*, Seventh edition by William D. Callister, Jr., Wiley & Sons Inc., 2007  
*Materials Science and Engineering Laboratory*, C. H. Hsu, CSU Chico, 2008
- Class Times:** Lecture, Activity (THMA 108) MWF 9:00 – 9:50 a.m.  
Laboratory (OCNL 130) MECH 210-02: M 2:00 - 4:50 p.m.  
MECH 210-05: T 2:00 - 4:50 p.m.  
MECH 210-08: W 2:00 - 4:50 p.m.
- Homework:** There will be ten problems sets assigned on a regular basis. Most of these assigned problems are selected from *Questions and Problems* section at the end of each chapter. All assignments will be collected at the beginning of the class period a week after they are assigned. Assignments not turned in before or at the beginning of class period on the due day are considered to be late. **NO LATE HOMEWORK WILL BE ACCEPTED.**
- Answers to the assigned problems should be written, in numerical order of problem numbers, on engineering computation paper. All pages should be stapled at the top center of pages with course number, section and student name in the top right corner of the first page. About half of the problems assigned will be randomly selected and graded. Problem solutions will be posted on Vista accessible through student Portal connection and in the display case outside the instructor's office.
- Exams:** There will be three 50-minute term tests and a two-hour final exam. No make-up test will be given without permission prior to the event. All students are expected to take the final exam on the day and time scheduled by the university. No other date and time will be set for the final exam.
- Each of the three short term tests primarily covers the chapters covered after the previous test. The final exam is comprehensive, however, with greater emphasis on topics covered after the third term test.
- Answers to the test problems should include relevant work in a logical order with explanation where necessary. A simple “yes” or “no”, or just a final answer, is not

sufficient. When calculation is needed to arrive at a final answer, the formula(s) used, numerical substitutions, and correct units should be clearly shown. A complete and correct answer is necessary for full credits.

**Grades:** The final grade is based on homework, tests, final examination, and laboratory work:

Homework	15%
Term Tests (3)	40%
Final Examination	20%
Laboratory Work	25%

**Add/Drop:** The last day to add/drop classes without instructor's permission is Friday, February 8.

### Lecture Topics

Week of	Topics	Readings
1/28 – 2/1	Introduction Concept of Stress and Strain, Elastic Deformation, Mechanical Behavior	Chapter 1 6.1 – 6.9
2/4 – 2/8	Mechanical Behavior, Hardness, Other Mechanical Property Considerations	6.9 – 6.10
2/11 – 2/15	Fracture, Fatigue, Creep	8.1 – 8.15
2/18 – 2/22	Crystal Structures, Crystallographic Points, Directions, and Planes <b><i>Term Test No. 1</i></b>	3.1 – 3.12
2/25 – 2/29	Crystalline and Noncrystalline Materials, X-Ray Diffraction	3.13 – 3.17
3/3 – 3/7	Imperfections in Solids	4.1 – 4.11
3/10 – 3/14	Diffusion	5.1 – 5.6
3/17 – 3/21	University Holidays, no classes held	-----
3/24 – 3/28	Deformation and Strengthening Mechanisms <b><i>Term Test No. 2</i></b>	7.1 – 7.13
3/31 – 4/4	Phase Diagrams	9.1 – 9.20
4/7 – 4/11	Phase Transformations in Metals	10.1 – 10.9
4/14 – 4/18	Structure and Properties of Ceramics	12.1 – 12.11
4/21 – 4/25	Polymer Molecular Structures <b><i>Term Test No. 3</i></b>	14.1 – 14.14
4/28 – 5/3	Characteristics and Processing of Polymers, MEMs	15.1 – 15.24
5/5 – 5/9	Particle-Reinforced Composites, Fiber-Reinforced Composites	16.1 – 16.15
5/12 – 5/16	Corrosion of Metals, Oxidation	17.1 – 17.10
<b>5/17 (Mon.)</b>	<b><i>Final Examination, 10:00 – 11:50 a.m. in THMA 108</i></b>	-----