

California State University, Chico
MECH 410 – Advanced Materials Science and Engineering
Spring Semester 2018



- Catalog Description:** Design, manufacture, and practical applications of advanced engineering materials. Failure analysis and prevention of material failure in mechanical design. Microfabrication of micromechanical devices.
- Prerequisites:** MATH 260, MECH 210. Recommended: CIVL 311.
- Class Times:** TR 12:30 - 1:45 AM, OCNL 121
- Instructor:** Dr. C. H. Hsu, OCNL 425 Phone: 530.898.5374 email: chhsu@csuchico.edu
Office hours: MW 1:00-1:50 PM, R 2:00-3:50 PM
- Textbook:** No specific textbook required. Class handouts and online material will be used.
- Homework:** There will be homework assignments on a regular basis. Assignments are due at the start of the class period a week after they are assigned unless otherwise specified. Those submitted after the collection at the start of the class period are considered to be late. Homework placed in the instructor's mailbox later than the start of the class time is also considered late. *No late homework will be accepted.*
- All assignments will be returned to students before tests. Solution keys to the problems will be posted in the display case outside the instructor's office.
- For those analysis performed in Excel or other software programs the original output should be printed and submitted with other hand calculation, if any.
- A report will be required for each project. Report content and format are described in the project statement handout.
- Exams:** There will be two 50-minute midterm tests, short quizzes, and a two-hour final exam. All exams are open-book. Midterms will usually be on Thursday of the week scheduled. At least a week advance notice will be given prior to the exam.
- There will be no make-up quizzes. Make-up midterms are available only with prior permission and arrangement. A doctor's note will be needed for the absence from an exam due to illness. Students will take the final exam on the day and time scheduled by the university.
- Grades:** Overall grade for the course will be based on homework, midterms, quizzes, and the final exam.
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| Assignments/Projects | 30% | | A: >90% of total |
| Mistern tests (2) | 40% | and | B: 80-89% of total |
| In-class quizzes | 10% | | C: 70-79% of total |
| Final exam | 20% | | D: 60-69% of total |
- Add/Drop:** The last day to add/drop the class without instructor's permission is Friday, Feb. 2.

Course Schedule:

Dates (No. of Weeks)	Topic
1/22 - 2/16 (4)	Various advanced materials and processing: composition and microstructure, properties and performance, fabrication processes, technical applications
2/19 - 3/16 (4)	Scanning electron microscopy: electron optics, construction of scanning electron microscope (SEM), functions and operation of SEM, semi-quantitative elemental analysis, sample preparation, projects
3/19 - 3/23 (1)	Spring break, no classes
3/26 - 4/13 (3)	Microfabrication: material, microfabricated devices in various fields, concepts and principles of microfabrication, microfabrication processes, projects
4/16 - 5/11 (4)	Engineering composites: types, construction, general behavior of laminated composites, stiffness analysis of laminates, failure theories/criteria and analysis
5/15 (Tuesday)	Final exam, 2:00-3:50 PM in OCNL 121

Americans with Disabilities Act: If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations. Accessibility Resource Center (530-898-5959) and Student Services Center (<http://www.csuchico.edu/arc/about-arc/index.shtml>).

Academic Honesty: With computer-based assignments, it is often tempting and convenient to copy the work of others. This is plagiarism and is not tolerated. Incidences of plagiarism, or other forms of academic dishonesty, will be referred to the Student Judicial Affairs. The consequence may range from failure in this course to expulsion from the University. Refer to the Academic Honesty section of the university catalog at <http://catalog.csuchico.edu/viewer/16/ACAREGS.html#AcademicHonesty>, or ask the instructor if you are unclear about a specific situation.