

California State University, Chico
MECH 210L – Materials Science and Engineering Laboratory
Spring Semester 2023



Instructor Dr. Ozgul Yasar
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Office Hours: Mondays: 10 am -12 pm and Wednesdays: 10 am -12 pm or by appointment

Catalog Description Standards and procedures for materials testing. Hands-on experience with commonly used equipment for materials testing. Test data acquisition and integration for material properties. Presentation of test data and findings in technical reports. 3 hours of laboratory.

Co-requisite MECH 210 (Materials Science and Engineering)

Textbooks *Materials Science and Engineering Laboratory*, C. Hsu et. al., CSU Chico, 2016
Available in the Bb Learn site for the course.

Lab Times Laboratory sections will be online. Zoom link for Laboratory sections is available on Blackboard.

Section-01 Tuesday 11:00 am – 1:50 pm
Section-02 Wednesday 2:00 pm – 4:50 pm
Section-03 Thursday 11:00 am – 1:50 pm

Evaluation The overall course grade will be based on lab reports, quizzes, and a final exam.

| | |
|-------------|-----|
| Lab Reports | 65% |
| Quizzes | 15% |
| Final Exam | 20% |

| Grade | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | F |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|
| | 93-100 | 90-92 | 87-89 | 83-86 | 80-82 | 77-79 | 73-76 | 70-72 | 66-69 | 60-65 | <60 |

Safety Laboratory Safety Policies and Procedures are strictly enforced in the lab. Students are expected to attend the safety training and become familiar with the safety policies and procedures. Each student is required to submit a signed acknowledgment form for safety training before the first lab experiment. A sticker will be attached to the student’s university I.D. card after the safety training is satisfactorily completed. Shirts and shoes are required in the laboratory. Sandals and open-toe shoes are not allowed for safety reasons. Students not safely dressed will be asked to leave the laboratory resulting in absence or tardiness.

Lab Reports Lab reports are strictly individual and must be single sided, Times New Roman, size 11 font, typed, single space, standard 1" margins, figures and tables labeled, equations typed, page numbers, clean, tidy, and professional for complete credit. Reports must have a Title Page, Assignment (from Laboratory Manual), Objectives, Materials/Apparatus, Results, Calculations, Conclusion sections, and Raw Data. The cover page should show the course name and section, experiment title, student name, lab partner names, and date. The Calculation and Results section should contain all calculations, figures from experimental data, and results in the proper order. Figures must be produced using Excel (or similar software) and clearly labeled.

Lab reports found with digital copied content will result in an automatic F pending further review by Student Judicial Affairs.

Quizzes There will be two closed-book quizzes during the semester. Questions will cover the preceding lab experiments.

Lab Final The compressive final exam will consist of questions related to the theory, measurements, and calculations of each experiment.

Expectations Students are expected to acquire knowledge of the following topics

1. Determine the crystal and chemical structure of materials.
2. Measure the hardness of metals and plastics.
3. Prepare microscopy samples of steel and analyze the grain structure.
4. Execute a tensile test and interpret the results.
5. Harden a metal with cold forming.
6. Identify stress concentration in a body under force.
7. Execute a Charpy Impact Test and interpret the results.
8. Execute a Jominy Quenchability Test and extrapolate the results.
9. Increase the hardness of aluminum with the Precipitation Hardening method.
10. Obtain an infrared spectrograph of a plastic and interpret the results.
11. Be able to interpret commercial data sheets of the mechanical properties of a metal or plastic.
12. Be able to prepare a professional looking laboratory report using a word processor, a spreadsheet, and an equation editor.

MECH 210L Lab Schedule for Spring Semester 2023 (Tentative)

| Wk | From | To | EXPERIMENT | Wk | From | To | EXPERIMENT |
|----------|---------------|---------------|---------------------------|-----------|---------------|---------------|-----------------------------|
| 1 | 23-Jan | 27-Jan | Safety | 9 | 20-Mar | 24-Mar | Tensile Test |
| 2 | 30-Jan | 3-Feb | Lab Report Prep. Workshop | 10 | 27-Mar | 31-Mar | No Lab |
| 3 | 6-Feb | 10-Feb | SEM | 11 | 3-Apr | 7-Apr | Strain Hardening |
| 4 | 13-Feb | 17-Feb | FTIR | 12 | 10-Apr | 14-Apr | Stress Concentration |
| 5 | 20-Feb | 24-Feb | Microscopy | 13 | 17-Apr | 21-Apr | Quiz#2 |
| 6 | 27-Feb | 3-Mar | Hardness | 14 | 24-Apr | 28-Apr | Impact (Safety Glass Req'd) |
| 7 | 6-Mar | 10-Mar | Quiz#1 | 15 | 1-May | 5-May | Jominy Raman Spectrometer |
| 8 | 13-Mar | 17-Mar | Spring Break | 16 | 8-May | 12-May | No Lab (Dead Week) |
| | | | | 17 | 15-May | 19-May | Final Exam (TBD) |

Dropping and Adding Class

Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc., found in the [CSU Chico University Catalog](#). You should be aware of the new deadlines and penalties for adding and dropping classes.

Academic Integrity

Students are expected to be familiar with the University's Academic Integrity Policy. Your own commitment to learning, as evidenced by your enrollment at California State University, Chico, and the University's Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Judicial Affairs. The policy on academic integrity and other resources related to student conduct can be found at: <http://www.csuchico.edu/sjd/integrity.shtml>

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.

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530-898-5959
Student Services Center 170
arcdept@csuchico.edu
hhunt@csuchico.edu

**Student Learning
Center**

The mission of the Student Learning Center (SLC) is to provide services that will assist CSU, Chico students to become independent learners. The SLC prepares and supports students in their college course work by offering a variety of programs and resources to meet student needs. The SLC facilitates the academic transition and retention of students from high schools and community colleges by providing study strategy information, content subject tutoring, and supplemental instruction. The SLC is online at <http://www.csuchico.edu/slc>