UNIVERSITY OF CALIFORNIA
Department of Materials Science & Engineering

MAT SCI 45L - Properties of Materials Laboratory
Spring 2021

Instructor: Professor Phillip Messersmith
Office: 218 Hearst Memorial Mining Building

GSIs: Peyman Delparastan (delparastan@berkeley.edu)
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Course Website: bCourses

Zoom Link for Office Hours:
https://berkeley.zoom.us/j/97759995689?pwd=OWYzT0d5NG1NcHdQejRwdnpOVDUzQT09
Meeting ID: 977 5999 5689 Passcode: 334744

Office Hours					
	M	**T**	**W**	**T**	**F**
Messersmith	1:10-2 pm	11-12 am			
Delparastan	2-3 pm		1-2 pm		
Avellan			9-10 am		4-5 pm

Zoom Link for All Labs and Discussions:
https://berkeley.zoom.us/j/96685852128?pwd=d1pBUVMyc29zbFFpbTl2RGZFcUJPdz09 (Links to an external site.)
Meeting ID: 966 8585 2128 Passcode: 244015

Labs and Lab Discussions					
	M	**T**	**W**	**T**	**F**
8-11 am		Section 101			
2-5 pm		Section 102	Section 103	Section 104	

Lab Schedule (subject to change)

Week	Lab	Assignments Due
Jan 18-22	Ethics Lecture (PBM)	
Jan 25-29	Lab 1 Discussion: Hardness (D)	Ethics Case Study
Feb 1-5	Lab 1 Hardness (D)	
Feb 8-12	Lab 2: Recovery/Recrystallization/Grain Growth (D)	Lab 1 Report
Feb 15-19		
Feb 22-26	Lab 3: Binary Phase Diagram (A)	Lab 2 Report
Mar 1-5		
Mar 8-12	Lab 4: Heat Treatment of Steel (D)	Lab 3 Report
Mar 15-19		
Mar 22-26	Spring Break	
Mar 29-Apr 2	Lab 5: Characterization of Polymers (A)	Lab 4 Report
Apr 5-9		
Apr 12-16	Lab 6: Mechanical Properties of Metals (A)	Lab 5 Report
Apr 19-23		
Apr 26-30		Lab 6 Report

Objectives

The objectives of this course are to provide undergraduate engineering and science students with hands-on experiences in foundational materials science topics, and to serve as a practical extension to the lecture-based course MAT SCI 45 – Properties of Materials. MAT SCI 45 provides broad coverage of the field for non-majors who may not be able to take another course in materials science & engineering, and it serves as the introductory course in the major field, laying the foundation for understanding the relationship between the internal structure of matter and the properties of materials that make them attractive for engineering applications. This course will apply these basic principles in a laboratory setting while providing practical experience in writing, ethics, and other skill sets.

Optional Textbook

W.D. Callister, Jr. & D. G. Rethwisch, Materials Science and Engineering an Introduction, 10th Edition, Wiley (2020). It is not required for the lab but may be a useful supplemental resource. Any recent edition (e.g. 9th Ed.) would serve this purpose.

Connection to MAT SCI 45

MAT SCI 45L augments the topics of the MAT SCI 45 lecture. Students taking MAT SCI 45 are not required to take MAT SCI 45L, but those taking MAT SCI 45L must have already completed or be taking MAT SCI 45 concurrently. The labs do not align perfectly with MAT SCI 45 lectures. Some labs will cover content not yet discussed in lecture.

Grading

Ethics Case Study: 16%
Lab Reports: 84%
(there are no exams in this course)

Course Components

The course consists of one (1) ethics session, six (6) 1-hour lecture/discussion sessions (occurring the week prior to each laboratory experience) in which fundamental information about the laboratory experiments will be discussed, and six (6) 3-hour laboratory experiences occurring every other week taught by GSIs and Laboratory Staff and overseen by the lead instructor.

Ethics (Week 1)

- Lecture on ethics
- Assignment of an ethics case study, with a written report due one week later. More details will be provided at the first lab meeting.

Discussions (Alternate Weeks 2-13)

- Lecture/discussion about the lab that will be performed the following week
- Before Class: Read the *Laboratory Manual* posted on bCourses.

Labs (Alternate Weeks 3-14)

- Before Class: Review the *Laboratory Manual*.

- During Class: "Watch Party" led by a GSI. A videotape of the lab will be shown. The GSI will pause the playback at key points to take questions and emphasize important concepts.
- After Class: A data set will be distributed to students, which you will use to write your report.

Lab Reports (Alternate Weeks 2-14)

- Refer to the *Laboratory Guide* posted on bCourses for an overview of the format and expectations of your lab reports. Specific instructions for each lab report can be found in the respective *Laboratory Manuals*.
- Reports are to be submitted electronically through bCourses and are due 1 week after the beginning of your laboratory session. Example: laboratory section 102 reports will be due online by 2:00PM the following Tuesday.
- You have the option of working with one other student in the course to write a joint report. Alternatively, you may write your own report. In all cases, duplicating whole lab reports, or portions of lab reports, from another student (including students that took the course previously) is not permitted and will be subject to disciplinary action as described below.
- Should you choose to work with a partner, you are required to include a table similar to the one below to indicate the contributions of each team member to certain aspects of the report.

	Data Analysis	Data Plotting	Abstract	Introduction	Experimental Procedure	Results & Discussion	Conclusion
Student 1							
Student 2							

E=equal contributor; S=sole contributor; 1=primary contributor; 2=secondary contributor

Additional Course Policies

Plagiarism Check

We will employ Turnitin or related software to promote academic integrity.

Late Assignments

No late submissions will be accepted except for the following circumstances. These include a medical condition that prevents completion of the assignment, deaths in the family, jury duty, etc. Plan ahead and avoid submitting at the deadline: "My internet service crashed 5 minutes before the deadline so I could not submit my assignment on time" will not be accepted as an excuse.

Re-grading Policy

Re-grade requests must be submitted to the GSI responsible for the lab in question (see table above), within one week of score posting. Students are required to submit a written request by email with a clear and detailed written description of what you have done and why you think it merits a re-grade, using complete sentences, punctuation and no SMS/social media

abbreviations. LOL! THX! Simple fixes such as addition errors will be corrected immediately. Note that a request for a regrade does not guarantee a change in grade, and that re-grading may uncover previously undetected errors on other problems that could change your grade. Appeals of the results of GSI re-grading can be made to Professor Messersmith, who will make a final decision.

Support During Remote Learning

We understand that your specific situation may present challenges to class participation. Please contact the instructors if you would like to discuss these and co-develop strategies for engaging with the course.

- The Student Technology Equity Program (STEP) is available to help access a laptop, Wi-Fi hotspot, and other peripherals (https://technology.berkeley.edu/STEP).
- You will be alerted as to when synchronous sessions are about to be recorded. There is a verbal alert when the instructor/GSI begins the session. If you join subsequently you will not hear the alert but should assume that the session is being recorded. If you prefer not to be recorded, you may turn your video and microphone off.
- Please set your Zoom name to be the name you would like the instructors to call you. You may optionally include your personal pronouns.
- Please set your Zoom picture to an appropriate profile picture of you to foster a sense of community and enhance interactions. If you are not comfortable using an image of yourself, you may use an appropriate picture of an avatar.
- We encourage participating with your video on to foster a sense of community and enhance interactions. However, we understand that some students are not comfortable with video or may not be able to participate by video.

Accommodation Policy

We honor and respect the different learning needs of our students, and are committed to ensuring you have the resources you need to succeed in our class. If you need accommodations for any reason (e.g. religious observance, health concerns, insufficient resources, etc.) please discuss with your instructor or academic advisor how to best support you. We will respect your privacy under state and Federal laws, and you will not be asked to share more than you are comfortable sharing. The disabled student program is a related resource.

Inclusion

We are committed to creating a learning environment welcoming of all students. To do so, we intend to support a diversity of perspectives and experiences and respect each others' identities and backgrounds (including race/ethnicity, nationality, gender identity, socioeconomic class, sexual orientation, language, religion, ability, etc.). To help accomplish this:

- If you feel like your performance in the class is being impacted by a lack of inclusion, please contact the instructors, your ESS advisor, or the departmental Faculty Equity Advisor (list and information at: https://diversity.berkeley.edu/faculty-equity-advisors). An anonymous feedback form is also available at https://engineering.berkeley.edu/about/equity-and-inclusion/feedback/.

- If you have a name and/or set of pronouns that differ from your legal name, designate a preferred name for use in the classroom at: https://registrar.berkeley.edu/academic-records/your-name-records-rosters.
- If you feel like your performance in the class is being impacted by your experiences outside of class (e.g., family matters, current events), please don't hesitate to come and talk with the instructor(s). We want to be resources for you.
- We are all in the process of learning how to respect and include diverse perspectives and identities. Please take care of yourself and those around you as we work through the challenging but important learning process.
- As a participant in this class, recognize that you can be proactive about making other students feel included and respected.

Academic Code of Conduct

Everyone in this class is expected to adhere to Berkeley Honor Code: "As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others."

Ethical conduct is of utmost importance in your education and career. The instructors, the College of Engineering, and U.C. Berkeley are responsible for supporting you by enforcing all students' compliance with the Code of Student Conduct and the policies listed in the CoE Student Guide The Center for Student Conduct is set up to support you when you have been affected by actions that may violate these community rules. This includes an organized and transparent process, student participation in the process, mechanisms for appeals, and other mechanisms to protect fairness.

Academic Honesty

You are encouraged to form study groups and work together to understand course material, but all written work as well as responses to in-class questions should be your own. There are ways to make your work personal and unique even when it seems that there is only one way to correctly answer a question, and the instructors will support you in learning these methods.

This course has a "zero-tolerance" policy concerning cheating and plagiarism. Students are referred to the University of California, Berkeley Student Code of Conduct for complete details on expectations. Special attention should be given to Section V and Appendix II. Cheating and plagiarism will be dealt with according to established campus policy. Students caught cheating will receive a failing grade and a report to the Center for Student Conduct will be filed. The following is a partial list of common cheating/plagiarism situations to avoid:

1. Attempts to "doctor" or manipulate assignments after grading to enhance scores will be considered academic dishonesty and dealt with as described above.
2. Submitting the same work as another student in MAT SCI 45L.
3. Partial or full replication of lab reports from students that have previously taken the course.