UNIVERSITY OF CALIFORNIA, DAVIS
Department of Materials Science and Engineering

EMS 162: Structure and Characterization of Engineering Materials
DRAFT COURSE SYLLABUS - Winter 2021

Instructor: Professor Yayoi Takamura
email: ytakamura @ ucdavis.edu
Office hours: M 3-4pm and W 10-11am, or by appointment via Zoom

Teaching Assistant: Name: Mingzhen Feng
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Office hours: W 4-5pm, or by appointment via Zoom

Course Times: **Lectures**: TR 9:00-10:20 am
Discussion: F: 2:10-3:00pm

Lectures, Discussion, and all TA and instructor office hours will be delivered live/synchronously through Zoom throughout the Winter quarter. Look for the Zoom tab on the Canvas site. The Invitation buttons have full information on calling into the meeting by phone or other means. A webcam/microphone is not required, though breakout rooms will be used to work through problems in small groups so you will need a way to communicate with others. You will be able to ask question verbally or using the chat function in the lectures. Lectures and Discussion will be recorded for viewing asynchronously at other times. If the live format fails disastrously, then pre-recorded videos will be the sole format.

Practice problems related to recent lecture material/homework will be posted to the **Discussions** tab of the Canvas site and worked through collectively during the Discussion session (in small breakout rooms and with the whole class).

All UC Davis students can obtain a licensed Zoom at no cost to them, including the ability to host meetings with up to 300 participants and no meeting time limits.

Announcements: Important class announcements will be made via the course Canvas site. Only consult material available for this offering of the class. ***READ CANVAS ANNOUNCEMENTS REGULARLY!*** You can set Canvas notifications to receive alerts/emails when new information is posted.

Textbook: Vitalij K. Pecharsky and Peter Y. Zavalij, *Fundamentals of Powder Diffraction and Structural Characterization of Materials, Second Edition*, Springer, soft cover ISBN: 978-0-387-09578-3; e-book ISBN: 978-0-387-09579-0. Note: UC Davis has electronic access to this textbook and an offer to receive a soft cover version for $24.99. You must be logged into the UC Davis Library VPN in order to access this deal.

Other References: A copy of these textbooks will be available through the **Reading List** section of the Canvas site.

B.D. Cullity and S.R. Stock, *Elements of X-Ray Diffraction (3rd edition)*, Prentice Hall, ISBN-10: 0201610914

A.D. Krawitz, *Introduction to Diffraction in Materials Science and Engineering*, Wiley, ISBN: 9780471247243

Gregory S. Rohrer, *Structure and Bonding in Crystalline Materials,* Cambridge University Press, ISBN: 9780521663793

James Shackelford, *Introduction to Materials Science for Engineers, 7th or 8th editions*, Pearson, 2009/2014, ISBN-13: 978-0136012603/978-0133826654

Prerequisites: Grade of C- or better in Math 22A, grade of C- or better in Phys 9B, and grade of C- or better in ENG 45/45Y

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Grading:	Homework (~7 assignments – due Thursdays)	40%
	Quizzes (random – via Canvas)	10%
	Term paper	15%
	Extended homework in place of Midterm (approx. 2/11)	15%
	Final Exam (24 hr Take Home Exam released at 10am 3/16/21)	20%

The grades may be curved up (otherwise grades will be assigned according to point values). Regrade requests for homework and extended homework must be submitted within one week of the release of the grades for each assignment.

Course Policies:

1. Quizzes will be administered through the Quizzes section of the Canvas site and are designed to keep you on track for watching the lectures following the course schedule. They will be scheduled randomly throughout the quarter. They will be based on the material for a given lecture and you will have until the scheduled start time of the next lecture to complete the quiz (i.e. > 46 hours). You will be able to drop the scores of two quizzes.
2. Homework and extended homework will be due at 5:00 pm on the specified due date (Thursdays) and must be submitted electronically to Canvas. LATE homework and extended homework will be accepted within 24 hours of the due date with a **20% penalty** calculated based on the point total of the assignment. The late penalty will increase to **40%** for submissions between 24 and 48 hours after the due date. No submissions will be accepted after 48 hours after the due date. Canvas automatically timestamps the submission time. It is your responsibility to ensure that you upload the correct file, all the pages are uploaded, and that all the pages are legible. Save your homework files with clear names including your name, the class name, and assignment name (i.e. EMS162_HW1_YOUR NAME).
3. You may discuss **homework** and **extended homework** with other students, but submitted work must be your own and distinct from other students' submissions.
4. The **term paper** is intended to give you the opportunity to investigate one subject relevant to the course material and that is of interest to you in more depth. The topic should relate to the structure of a type of material and how it relates to its properties; or a characterization technique used to determine the structure or composition of materials.
5. The **final exam** will be a take home exam that will be open note, open book, and open internet aka open distraction, but your work must be **your individual effort**. You will have a full 24 hour period to complete the exam and you will submit your answers electronically to Canvas. **LATE SUBMISSIONS WILL NOT BE ACCEPTED.** Canvas automatically timestamps the submission time. It is your responsibility to ensure that you upload the correct file and that all the pages are legible.
6. The UC Davis Code of Academic Conduct will be strictly enforced (see https://ossja.ucdavis.edu/code-academic-conduct) and it is expected that students will abide by the UC Davis Principles of Community (see https://diversity.ucdavis.edu/principles-community). These policies include following proper etiquette while participating in/viewing Zoom lectures/office hours, for the take home final exam, as well as sharing course materials on other websites (i.e. CourseHero).

The Academic Assistance and Tutoring Centers hosts Writing Support Center Services (see https://tutoring.ucdavis.edu/writing) and the Aggie Grammar Guide (see https://tutoring.ucdavis.edu/agg) which you may find useful when writing lab reports.

Online Submission Guidelines

- Save your homework files with clear names including your name, the class name, and assignment name (i.e. EMS162_HW1_YOUR NAME).
- Please do not upload *.HEIC files as they can't be opened in Canvas.
- Allow plenty of time before the submission deadline for internet or Canvas connectivity issues.

- Double-check your submission *every time* to make sure the correct submission was posted without file corruption.
- For questions involving images that I provided, you can screen capture the image and mark your answers electronically using programs such as Word, PowerPoint, or Paint. (i.e. use the 'Print Screen' button on your keyword and paste the image into the other program)

Use of Plotting Software

Homework may require the use of plotting software to calculate equations and plot data. No specifications of any particular software will be made, but options include Excel, Matlab, Python, Origin, Google Sheets etc… Note that Office 365 is available for all UC Davis students https://iet.ucdavis.edu/content/free-microsoft-office-365-now-available-all-uc-davis-students

Student Resources

Prof. Susan Ebeler has compiled an extensive list of valuable student resources at: https://ebeler.faculty.ucdavis.edu/resources/faq-student-resources/

Plagiarism Statement

According to Dictionary.com, plagiarism is defined as: "*1: an act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author*".

DON'T DO IT! In this course, we will use TurnItIn, an electronic resource that compares your work to online sources and a comprehensive database of other papers for the term paper. TurnItIn creates an originality report identifying whether parts of your work match or are similar to any of their sources. The work submitted to TurnItIn will be retained as source documents in the TurnItIn reference database to be used solely for the purpose of checking future submitted work for originality. TurnItIn will be used for the **term paper**. Suspected misconduct on any portion of this class will be reported to the Office of Student Support and Judicial Affairs and, if established, will result in disciplinary sanctions up through Dismissal from the University and a grade penalty up to a grade of "F" for the course.

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UC Davis Student Disability Center (SDC) Statement

UC Davis is committed to educational equity in the academic setting, and in serving a diverse student body. I encourage all students who are interested in learning more about the Student Disability Center (SDC) to contact them directly at sdc.ucdavis.edu, sdc@ucdavis.edu or 530-752-3184. If you are a student who currently receives academic accommodation(s), please submit your SDC Letter of Accommodation to me as soon as possible, ideally within the first two weeks of this course.