

**UNIVERSITY OF CALIFORNIA, DAVIS**  
**Department of Chemical Engineering and Materials Science**

**EMS 262: Advanced Structural Properties of Materials**  
**COURSE OUTLINE - Fall 2014**

Instructor: Professor Yayoi Takamura  
2009 Kemper Hall  
x4-7124  
email: ytakamura @ ucdavis.edu  
Office hours: Tuesdays 1:30-2:30pm, or by appointment  
Course webpage: SmartSite

Textbook: Gregory S. Rohrer, *Structure and Bonding in Crystalline Materials*, Cambridge University Press, ISBN: 978-0-521-66379-3

Additional readings will be posted on the course SmartSite

Other References: A copy of these textbooks will be available on reserve at the library

Marc De Graef and Michael E. McHenry, *Structure of Materials: An Introduction to Crystallography, Diffraction and Symmetry*, Cambridge University Press, ISBN: 978-0521651516

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

A.D. Krawitz, *Introduction to Diffraction in Materials Science and Engineering*, Wiley, ISBN-10: 0471247243

Vitalij K. Pecharsky and Peter Y. Zavalij, *Fundamentals of Powder Diffraction and Structural Characterization of Materials, Second Edition*, Springer, ISBN: 987-0-387-56088-5. Note: UC Davis has free electronic access to this textbook and an offer to receive a paperback version for \$24.95 including shipping. See UC Davis Harvest Library Catalog for more details.

<u>Grading:</u>	Homework (due in class)	30%
	Midterm Exam (Nov. 5th, in class)	30%
	Final Exam (Fri. Dec. 19 <sup>th</sup> , 6:00pm)	40%

Course Policies:

1. Homework will be due in class on the specified due date. No late homework will be accepted.
2. Exams will be closed book, closed notes, but you will be allowed one 8 ½ “ x 11” cheat sheet for the midterm exam and two 8 ½ “ x 11” cheat sheets for the final exam.
3. Unless you are instructed otherwise, you may discuss homework problems with other students in the class, but submitted work must be your own. The UC Davis Code of Academic Conduct will be strictly enforced. (see <http://sja.ucdavis.edu/sja/cac.htm>)
4. It is expected that students will abide by the UC Davis Principles of Community (see <http://www.ucdavis.edu/principles.html>).

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**Tentative Topic List - Fall 2014**

Bonding (loosely following Rohrer Chapters 6-9)

Basic Structural Concepts (Rohrer Chapter 2)

Symmetry in Crystal Structures (Rohrer Chapter 3)

Crystal Structures (Rohrer Chapter 4)

Defects

X-ray Diffraction (Pecharsky and Zavalich Chapter 5)

Neutron Diffraction

Electron Diffraction

Etc...