

**Spring 2018**

**Dept. of Manufacturing System Engineering and Management  
MSE 227 – Materials Engineering (Class # 15982)**

**Time:** Monday/Wednesday: 9:30-10:45 PM, room JD3504

**Instructor:** Prof. B. Bavarian  
Office: JD3513, **Office Hour: M/W 8:30-9:20 AM**  
Email: [bavarian@csun.edu](mailto:bavarian@csun.edu)  
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**Textbook:** David G. Rethwisch and William D. Callister Jr,  
Fundamentals of Materials Science and Engineering: An Integrated Approach, John Wiley & Sons, NY, **4th Edition, 2012.** <http://www.wiley.com/college/callister>

**Tentative schedule:**

Date	Topic	notes
Jan 22	Introduction	
Jan 24	Atomic Structure - Chapter 2	
Jan 29	Crystal Structure - Chapter 3	
Jan 31	Miller Indices - Chapter 3	
Feb 5	Imperfections - Chapter 5	
Feb 7	Diffusion - Chapter 6	
Feb 12	Mechanical Properties - Chapter 7	
Feb 14	Mechanical Properties - Chapter 7	
Feb 19	Strengthening Mechanisms- Chapter 8	
Feb 21	<b>Exam #1 (Ch 2- 8)</b>	
Feb 26	Failures - Chapter 9	
Feb 28	Failures - Chapter 9	
Mar. 5	Phase Diagram- Chapter 10	<b>Outline for technical paper due Submit paper copy in class</b>
Mar 7	Phase Diagram- Chapter 10	
Mar 12	Phase Diagram- Chapter 10	
March 14	Phase Transformation - Chapter 11	
March 26	Phase Transformation - Chapter 11	
March 28	Electrical Properties - Chapter 12	
Apr 2	Materials Applications, metals - Chapter 13	
Apr 4	Materials Applications: ceramics	
April 9	Materials Applications: polymer	
April 11	Processing - Chapter 14	
Apr 16	<b>Exam #2 (Ch 9- 13)</b>	
Apr 18	<b>Library research</b>	
Apr 23	Composites - Chapter 15	
Apr 25	Composites - Chapter 15	
Apr 30	Composites - Chapter 15	

May 2	<b>Exam #3 (Ch 13-15)</b>	
<b>May 7</b>	Corrosion - Chapter 16	<b>Term paper due</b>
May 9	Corrosion - Chapter 16	
<b>May 16</b>	<b>Final Exam - comprehensive</b>	<b>8:00-10:00 AM in JD3504</b>

**Last day to drop: Friday, Feb. 9, 2018.**

**Three hours of lectures per week, Design units: 0.25**

**Prerequisites:** Chem 101, Phys 220A, Phys 220AL

**Corequisites:** Math 150B

**Course Description:** An introductory course in engineering materials including metals, ceramics, polymers, and composites. Study of atomic and crystalline structures of materials. Application of basic principles to the study of mechanical, physical, and chemical behavior of materials. Selection of materials in engineering applications based on materials properties and processing.

**Learning Objectives:** To understand the principles of engineering and science in applications of materials and design. To learn to find information in literature and other available sources. To learn to use information systems (computer, internet, and other available sources) in engineering practice.

**Methods of Student Evaluation:** Two midterm examinations, one final examination, weekly homework assignments, class attendance and term paper.

**Course Method and Expectations:** The main techniques used in this course center on the application of scientific principles to real-life situations. Library research is necessary to fully understand and assimilate the concepts discussed in class lectures. Homework assignments are an essential part of learning.

**Grading Policy:** A through F with Plus/Minus Grading.

<b>Homework and class quizzes</b>	<b>15%</b>
<b>Term Paper</b>	<b>5 %</b>
<b>(3) Midterm Exams (1.25 hrs)</b>	<b>40 %</b>
<b>Final Exam (2 hrs)</b>	<b>40 %</b>

**Exams will be based on lecture and text book material (example questions and assigned homework). All exams will be closed book and no notes.** No cell phones or other personal communication devices are permitted during exams. There will be weekly quizzes in each class.

**Study Suggestions:**

1. Read the relevant material in the book and check Webpage

## **Engineering College Statement**

**Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:**

- using their knowledge and skills for the enhancement of human welfare,
- being honest and impartial, and serving with fidelity the public, their employers and clients;
- striving to increase the competence and prestige of the engineering profession; and
- Supporting the professional technical societies of their disciplines.

### **Engineers shall:**

- hold paramount the safety, health and welfare of the public in the performance of their professional duties
- perform services only in the areas of their competence
- issue public statements only in an objective and truthful manner
- act in professional matters for each employer or client as faithful agents or trustees, and avoid conflicts of interest
- build their professional reputation on the merit of their services, and not compete unfairly with others
- act in such a manner as to uphold and enhance the honor, integrity and dignity of the profession
- continue their professional development throughout their careers and provide opportunities for the professional development of those engineers under their supervision

- 1. Class members are expected to submit original work except in joint projects in which the activities are cooperative and collaborative.**
- 2. Class members are expected to attend class except when circumstances are outside the member's control.**
- 3. Class members are responsible for material in the reading assignments, class presentations, discussions, and homework examples.**
- 4. Homework sets and project reports are due at the time requested**
- 5. Class members are expected to be cooperative with other class members and to collaborate when appropriate with colleagues.**
- 6. Class members are expected to participate in the oral presentations as required.**
- 7. Class members are expected to comply with University regulation governing intellectual property, origin of work, and honesty. Failure to maintain these standards will result in student disciplinary action and a grade of F in the course.**