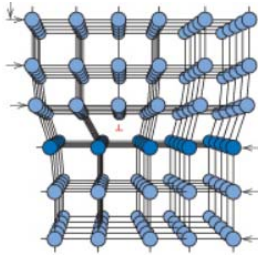


Engineering 4 – Section #59357



Instructor: Dr. John Heathcote **Class Times:** All Online

Office: Reedley College, FEM-1B (in Math Center, in FEM Building)

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Office Hours: Mondays and Wednesdays, 12:00-1:50 pm
Fridays, 10:00-10:50 am
Or feel free to stop by or make an appointment

Required Text: Materials Science and Engineering, An Introduction, 9th Edition, William D. Callister, Jr., Wiley, **with WileyPLUS Access**

Catalog Description: An introductory course on the properties of engineering materials and their relation to the internal structure of materials. Topics include: atomic structure and bonding, crystalline structures, phases and phase diagrams, metals, polymers, ceramics, composites, mechanical deformation and fracture, structural control and influence of properties, materials naming and designating systems, electrical properties, and magnetic properties.

Online Course Presentation: This course is being taught as a fully-online course. That means that all lecture presentations, homework assignments and other class activities will be via the Blackboard class page and the WileyPLUS website.

Typically, there will be two due dates each week. By that date, students are expected to read the appropriate sections of the textbook, view any online materials, complete any homework problems or other activities, and/or take part in online discussions.

Grading:	20%	Online Quizzes
	60%	Online Homework Assignments and Discussions
	20%	Written Homework Assignments

Online Quizzes: There will be an online quiz following the conclusion of most chapters. These will check your understanding of the concepts and calculations from that chapter. During the quiz, you will be able to use your notes, your book, and any online resources. However, there may be a time limit on the quizzes. That means that you will not have the time to learn the material during the quiz. You will need to have a good understanding of the chapter before you get started.

Quiz questions will be multiple choice, fill-in-the-blank, short answer, or essay questions. They may involve calculations or be conceptual.

Online Homework Assignments: As a way of learning the material, students will have regular online assignments using WileyPLUS.

Late Work Policy for Online Quizzes and Homework: Deadlines are very important. Quiz and homework problems completed after the deadline receive only 70% of the possible points. Quizzes and homework become completely unavailable two weeks after each deadline. If you have a good reason to ask for an extension of a deadline, you may contact the instructor. However, if students will only be able to do this a few times during the semester.

Online Discussions: To foster a learning community in our online class, we will occasionally have online discussions based upon the topics that we are learning. To receive credit for these discussions, you will need to post statements on the topic and reply to other students' posts. Good grades will be given to students who contribute the most to the discussions. Students will not earn any credit for late participation in discussions.

Written Homework Assignments: There will occasionally be assignments that are not the typical online homework assignment. Instead of performing these assignments through WileyPLUS website, you will be given a more open-ended assignment that you will submit with a Word file, spreadsheet file, or some other format. These assignments may be designed to go deeper into certain topics or to apply those topics.

Communication: Since we do not have an official meeting each week, it is important that you feel comfortable asking questions. Questions regarding assignments should be asked on the Blackboard Question and Answer discussion forum. Other concerns about the course can be answered by email or an office hour visit.

Grading Scale:	90-100%	A
	80-89%	B
	70-79%	C
	60-69%	D
	<60%	F

Add Date:	Friday, August 29 th	Last day to add a course
Drop Date:	Friday, October 10 th	Last day to drop this course
Holidays:	Monday, September 1 st	Labor Day
	Tuesday, November 11 th	Veterans' Day
	Thursday-Friday, November 27 th and 28 th	Thanksgiving Holiday

Accommodations for Students with Disabilities:

If you have a verified need for an academic accommodation or materials in alternate media (i.e., Braille, large print, electronic text, etc.) per the Americans with Disabilities Act (ADA) or Section 504 of the Rehabilitation Act, please contact me as soon as possible.

Here is the official Reedley College statement on Academic Dishonesty:

Students at Reedley College are entitled to the best education that the college can make available to them, and they, their instructors, and their fellow students share the responsibility to ensure that this education is honestly attained. Because cheating, plagiarism, and collusion in dishonest activities erode the integrity of the college, each student is expected to exert an entirely honest effort in all academic endeavors. Academic dishonesty in any form is a very serious offense and will incur serious consequences.

Cheating is the act or attempted act of taking an examination or performing an assigned, evaluated task in a fraudulent or deceptive manner, such as having improper access to answers, in an attempt to gain an unearned academic advantage. Cheating may include, but is not limited to, copying from another's work, supplying one's work to another, giving or receiving copies of examinations without an instructor's permission, using or displaying notes or devices inappropriate to the conditions of the examination, allowing someone other than the officially enrolled student to represent the student, or failing to disclose research results completely.

Plagiarism is a specific form of cheating: the use of another's words or ideas without identifying them as such or giving credit to the source. Plagiarism may include, but is not limited to, failing to provide complete citations and references for all work that draws on the ideas, words, or work of others, failing to identify the contributors to work done in collaboration, submitting duplicate work to be evaluated in different courses without the knowledge and consent of the instructors involved, or failing to observe computer security systems and software copyrights. Incidents of cheating and plagiarism may result in any of a variety of sanctions and penalties, which may range from a failing grade on a particular examination, paper, project, or assignment in question to a failing grade in the course, at the discretion of the instructor and depending on the severity and frequency of the incidents.

Here are my additional thoughts regarding Academic Dishonesty:

Academic integrity is very important in this online course. Since I do not see you directly in a classroom, I can only guess at what is happening on your side of the computer. I do appreciate the freedom and flexibility that this online set up gives you in taking this course. However, I also recognize the challenge in keeping this as a rigorous course in which I can truly assess your understanding of the material.

I have set up the assessments to be balanced between several different types of activities (quizzes, assignments, short papers, projects...). This allows me to use multiple measures to assess each student's performance in the course, and I believe, also dilutes the opportunity of students to cheat the system.

There are occasions in this class where it is perfectly acceptable to work together with other students. However, there are also specific occasions (most notably online quizzes) for which I expect you to do your own work. There are also occasions where you will need to do some writing. I do not want to see students' copying one another's answers for these assignments.

As you progress through college and work toward becoming an engineer, you will be developing your own personal reputation and integrity. Please use this course as your first step towards building that integrity by tackling this in an honest approach toward learning.

There are special challenges when a course is offered online. Stay disciplined to do what is required of you. Keep up with every deadline!!! Do not procrastinate!

Course Outline: (subject to change) -- Assignments are due by 11:45PM on the day shown.

Due Dates	Textbook Chapter	Topics
Friday, August 15 th	1	Introduction
Tuesday, August 19 th	2	Atomic Bonding
Friday, August 22 nd	Chapters 1 and 2 Review	
Tuesday, August 26 th	3A	Crystal Structures
Friday, August 29 th	3B	Crystallography
Tuesday, September 2 nd	Chapter 3 Review	
Friday, September 5 th	4A	Imperfections
Tuesday, September 9 th	4B	Imperfections
Friday, September 12 th	5	Diffusion
Tuesday, September 16 th	Chapter 4 and 5 Review	
Friday, September 19 th	6A	Stress and Strain
Tuesday, September 23 rd	6B	Elastic and Plastic Deformation
Friday, September 26 th	6C	Mechanical Properties
Tuesday, September 30 th	Chapter 6 Review	
Friday, October 3 rd	7A	Dislocations/Plastic Deformation
Tuesday, October 7 th	7B	Strengthening Mechanisms
Friday, October 10 th	8A	Fracture
Tuesday, October 14 th	8B	Fatigue / Creep
Friday, October 17 th	Chapters 7 and 8 Review	
Tuesday, October 21 st	9A	Phase Diagrams, Eutectic Phase Diagrams
Friday, October 24 th	9B	The Iron-Carbon System
Tuesday, October 28 th	10A	TTT Diagrams
Friday, October 31 st	10B	Phase Transformations and Mechanical Properties
Tuesday, November 4 th	Chapters 9 and 10 Review	
Friday, November 7 th	11	Alloys
WEDNESDAY, November 12 th	12/13	Ceramics
Friday, November 14 th	Chapter 11-13 Review	
Tuesday, November 18 th	14/15	Polymers
Friday, November 21 st	16	Composites
Tuesday, November 25 th	18	Electrical Properties
WEDNESDAY, December 3 rd	Chapters 14-18 Review	
WEDNESDAY, December 10 th	Semester Review Quiz/Assignment	

COURSE OUTCOMES:

Upon completion of this course, students will be able to:

- A. distinguish the different crystal structures of various materials and infer the material properties determined by them.
- B. classify crystal imperfections and discuss their influence on materials processes.
- C. use mechanical behavior data for a given material to predict a material's behavior under a certain load condition.
- D. interpret phase diagrams and predict material microstructures created by different heat treatments.
- E. identify the properties of the various classes of materials.
- F. assess the proper material to be used in certain applications.

COURSE OBJECTIVES:

In the process of completing this course, students will:

- A. define the types of bonds and list their properties.
- B. classify the various crystal structures and use crystallographic techniques to describe their features.
- C. describe crystalline imperfections and analyze their influence on material behavior.
- D. analyze stress-strain curves and calculate materials' reactions to various stress conditions.
- E. differentiate elastic and plastic deformation.
- F. describe the mechanisms for strengthening materials.
- G. calculate failure loads of materials based on fracture and fatigue.
- H. calculate materials' reactions under high temperature loading.
- I. interpret phase diagrams and solve problems based upon them.
- J. use phase diagrams to predict microstructural development in materials under heat treatment.
- K. analyze the properties of the various classes of materials.
- L. categorize and investigate the variety of materials within each materials class.
- M. outline and apply the electrical, magnetic and corrosive properties of materials.