ASEN 1022 - Spring 2020

Materials Science for Aerospace Engineers

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Class Web Site: log on to https://canvas.colorado.edu

Homework Site: Mastering Engineering

Discussion Q&A Site: In Canvas!

Class e-mail list: This is automatically done through Canvas.

Texts: J.F. Schackelford, *Introduction to Material Science for Engineers*, 8th edition. Pearson., including Mastering Engineering site.

Prerequisites: APPM 1350 or MATH 1300 (minimum grade C). Required co-requisite courses: COEN 1300 or ECEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320.

Course Objectives: Introduce the fundamental understanding of the relation between composition, structure, processing, and properties of materials. Topics include atomic bonding, perfect and imperfect crystal structures, thermal and mechanical behavior of materials, and failure mechanisms, and heat treatment. This course will provide insight into the design and selection of materials for aerospace applications.

Major Course Topics:

1. Atomic bonding.
2. Perfect and imperfect crystalline structures.
3. Diffusion.
4. Mechanical and thermal behavior.
5. Failure mechanisms.
6. Phase diagrams.
7. Heat treatment.
8. Material processing techniques.
9. Design and selection of materials

Grading Guideline:

Group work:	Lab 1	10%
	Homework*	15% (Mastering Engineering)
Individual:	3 Exams	75% (= 25% + 25% + 25%)
		100%

- **Group work only counts toward final grade if total individual grade is C or better.**
- **No exam grades will be dropped.**
- **Please verify all your scores and grades on Canvas within 2 weeks after they are posted; requests to change a score need to be made within this period. All grade requests come to the instructor in written form.**

Note: We reserve the right to make minor changes to this distribution of weights based on variations in assignments.

Exam Times and Locations:

1. Exam 1: 02/17, in class
2. Exam 2: 03/18, in class
3. Final Exam: 5/06, 7:30 to 9 PM

Evaluated Outcomes: The Department of Aerospace Engineering Sciences has adopted a policy of assigning grades according to evaluated outcomes (Ox) in each course. Each assignment designed and graded to assess some combination of several or a few of the following outcomes:

O1 Professional context and expectations (ethics, economics, etc.)
O2 Historical perspective and vision
O3 Multidisciplinary, system perspective
O4 Written, oral, graphical communication ability
O5 Knowledge of key scientific/engineering concepts
O6 Ability to define and conduct experiments, use instrumentation
O7 Ability to learn independently, find information
O8 Ability to work in teams
O9 Ability to design systems
O10 Ability to formulate and solve problems
O11 Ability to use and program computers

Important Notes:

1. Emails will be responded to during business hours, i.e. Monday through Friday, 8:00 am – 5:00 pm. Emails regarding exams or lab reports which are received 24 hours or less before the exam or lab report deadlines will not be responded to. Students are encouraged to attend office hours in lieu of emails as it enables clarity and learning.
2. Changes may be made to the weekly course schedule based on occurring events that require different dispositions. We will give sufficient advance notice through announcements in class and posting on Canvas. Changes to this syllabus and assignments-table may be announced at any time during class periods. We will post the current syllabus and assignments-table on Canvas. Both are dated in the footnote.
3. Canvas will be used to send out announcements, to provide comments to you daily on class activities, and to provide general information about course assignments.
4. Attendance to all lectures and labs is expected.
5. Why have reading assignments, homework, lab exercises, and exams?
    - Reading assignments are to be completed before the lecture/discussion. The lecture/discussions should help to clarify and supplement what you have read.
    - Homework assignments are to lead you through important applications of current material. Homework enforces the mental processes that help you to become proficient in a subject. Before beginning any homework assignment, you should read the text and work the

examples in the text. Homework, which is graded in the category "groupwork", may be discussed with the TAs/TFs.

- You are responsible for concepts introduced in labs on exams.
- The lab will help you to learn how to synthesize the basic concepts, methods, and tools presented in the course curriculum. The team-oriented approach will give you experience in working and cooperating in groups. Group members must inform the TAs early on when one student does not cooperate. **A portion (30%) of the lab grades will be from anonymous peer evaluation of the team members.**

6. Homework:

- All homework questions must be submitted to the Canvas discussion forum under the appropriate homework assignment/question. **No homework questions should be emailed to the instructional team- all questions should be asked at office hours or posted to Canvas**. The instructional team will not respond to posts that are posted after 5 PM the day before the homework is due.
- Collaboration is permitted on homework. However, we strongly recommend to first work on your own on the homework before comparing your results with your homework team members. Teams of up to three students are permitted. Groups may change during the semester. You may discuss the means and methods for formulating and solving problems and even compare answers, but you are not free to copy someone's assignment. **Copying material from any resource (including solutions manuals) and submitting it as one's own is considered plagiarism and is an Honor Code violation. Remember, the less you think about the problems yourself, the less you actually learn, and the more difficult it will be to succeed on exams.**
- You are encouraged to answer questions that other students pose to Canvas, but you may only discuss the means and methods for formulating and solving problems. You cannot compare answers on Canvas, and you may not post your exact work or computer code.
- No late assignments will be accepted without documentation of a medical or family emergency. If you must miss class for an excused absence, you may submit your homework early. There are no exceptions to this policy.
- Although each homework assignment will have several problems, all problems may not be graded. However, solutions will be provided to you for all the problems.
- All homework must be submitted through MasteringEngineering.
- Homework solutions are posted shortly after the submission deadline.

7. Exams:

- All academic-excused absences for exams or labs need to be communicated and approved 2 weeks ahead of the expected absence. Documentation for excused absence will be required. **These requests must be made in email to the instructor.**

- There will be no unexcused exam makeups provided. If you miss an exam, course instructors will evaluate each case on an individual basis based on the context and information available to make a determination if a makeup exam will be provided. Students are encouraged to provide as much documentation as possible to enable an informed decision

- If, under the circumstances outlined above, the instructor determines a make-up exam should be provided, the instructors reserve the right to not offer a make-up exam for either exam 1 or 2 and to instead count the grade of the student's comprehensive final exam in the place of the missed exam.

- Regrade requests must be submitted to the professors in writing within 2 weeks of the grade posting to Canvas. Submit the original assignment along with a typed page stating the problem number, grading issue, and what you believe the correct grade should be.

8. Labs:

    - SAFETY is the number one priority for laboratory exercises. Access to PILOT depends upon your compliance with the PILOT Contract you have signed to obtain a computer logon and after-hours key code. PILOT offers a mandatory orientation at the beginning of the semester. You are required to attend the safety lecture offered at the beginning of the semester. Students must satisfy the safety requirements by submitting a lecture report on safety. This report, graded satisfactory or higher, is required before participating in the experiments.

    - All team members are assumed to **contribute equally** to the overall progress and completion of the lab.

    - Food or drinks (even water) are not allowed on the workstations in the PILOT lab plaza.

    - Guidelines for Lab Reports will be handed out in a few weeks as they are assigned. Each lab assignment will include guidelines that are specific to the project.

    - Students are encouraged to submit lab questions to the Canvas discussion page under the appropriate lab number and check/participate in the ongoing discussions. As with the homework, you may discuss the means and methods for formulating and solving problems but you cannot compare answers on Canvas nor post your exact work or computer code.

9. Grading:
    - Minor adjustments may be made in the determination of final letter grades and with grade cut lines, but there is no "curving" in this course.

    - To receive a course grade of C or better (which is required to fulfill the prerequisite for ASEN2003 and other courses), students must receive a C or better in the individual

coursework portion of the class. Stated differently, the students who receive an individual grade of C- or lower will not receive any group grades.

Accommodation for Disabilities
If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the Disability Services website. Contact Disability Services at 303-492-8671 or dsinfo@colorado.edu for further assistance. If you have a temporary medical condition or injury, see Temporary Medical Conditions under the Students tab on the Disability Services website.

Classroom Behavior
Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on classroom behavior and the Student Code of Conduct.

Honor Code
All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code (honor@colorado.edu); 303-492-5550). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the Honor Code Office website.

Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation
The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct intimate partner abuse (including dating or domestic violence), stalking, protected-class discrimination or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, anonymous reporting, and the campus resources can be found on the OIEC website.

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

Religious Holidays

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, excused absences for exams or labs on religious holidays need to be communicated to the instructor via email 2 weeks ahead of the expected absence**.**

See the campus policy regarding religious observances for full details.

Final Comments

Our grading scheme is not assigned to reward or punish. It is designed to indicate your level of competency compared to the standards set by the AES faculty. Do you meet the minimum level of competency? Do you exceed the minimum? Are you below the minimum? This should be indicated by the final grade. We (the faculty) are professionals and it is our job to set and maintain standards. We are expected to use our education, experience, and interactions with industry, government laboratories, others in academe, etc., to determine the content of these standards. Because our program is accredited by ABET (Accreditation Board for Engineering and Technology), the AES curriculum meets that board's requirements. As with any other professionals (doctors, lawyers, etc.) you must trust that we know what we are doing and that we are obliged to uphold standards.

The final grade indicates your readiness to continue to the next level of courses. Meeting the minimum requirements indicates that you are prepared to continue at least at the minimum level required for the next in the sequence of courses. Exceeding the minimum means you are ready to enter the next course and that you have mastery of material beyond the minimum, i.e., you show some level of proficiency.

ASEN 1022 is designed to take advantage of the facilities of the PILOT to enrich your learning experience. We will provide a high-quality learning experience and we will uphold the academic standards determined by the AES faculty.