

Course Assistants: Zhuoying Chen (zhch1699@colorado.edu)
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Lectures: M/W/F: 2:00 – 2:50 pm, MATH 100

Class Web Site: log on to <https://canvas.colorado.edu/> to find ASEN 1022-001

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

Texts: J.F. Shackelford, *Introduction to Material Science for Engineers*, 8th edition. Pearson.

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 technique

Tentative Schedule for Coverage of Topics:

Week

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/CAs.

The experimental 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 of the total lab grade will be from anonymous peer evaluation of the team members.

6. Homework:

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 **three to four students** are permitted. Groups may change during the first two homeworks; after that the teams should be set. 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) is prohibited.**

15. The University of Colorado Boulder (CU-Boulder) is committed to maintaining a positive learning, working, and living environment. CU-Boulder will not tolerate, both in-class and outside of class, acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation. CU-Boulder's Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the [OIEC website](#).

16. All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to [the academic integrity policy](#) of the institution. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found