

Course Syllabus

MSE 2001_1, MSE2001_2– Summer 2026

Principles and Applications of Engineering Materials

MSE2001_1: 8-9:15 am T, Th , MSE2001_2: 10:25-12:20

Professor: Hamid Garmestani

Office: to be announced

Tel: (404) 385 4495

Office Hours: T, Th at 9:20-10:15, and any other time by prior appointment. Office hours can be arranged through zoom on canvas.

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TA's and TA office hours:

– To be announced

Course Description

The structure-property-processing-performance relationships of engineering materials are described. Materials selection is treated as a part of engineering design.

Expectations:

This section of MSE2001 is an in-person class but the lectures will be recorded and uploaded on canvas.

- 1- Attendance **is required**: Attendance will be acquired through in-class pop-up turning-point quizzes or attendance.
- 2- Online canvas quizzes and exams using honorlock.
- 3- **Group quizzes.**
- 4- Students are required to have access to a computer (MAC or PC) equipped with a webcam with wide view of the desk and student for the purpose of exams.

Prerequisite

Undergraduate Semester level CHEM 1310 Minimum Grade of D or,
Undergraduate Semester level CHEM 1102 Minimum Grade of D or Undergraduate Semester level CHEM 12X1 Minimum Grade of D or Undergraduate Semester level CHEM 1211K Minimum Grade of D or Undergraduate Semester level CHEM 1112 Minimum Grade of D

BY TOPIC:

1. Fundamental laws and theories of chemistry, thermodynamics and kinetics of reactions.

2. Fundamental laws and theories of physics, including physical principles of mechanics and the atomic and electronic structure of matter.

Course Goals

At the end of this course you will learn:

- Fundamentals of structure-property-processing relationships in engineering materials.
- Relate these fundamentals to the performance of the materials.
- Discuss the major properties of ceramics, metals, polymers and composites.
- understand strengthening mechanisms
- Failure mechanisms, such as fatigue, creep, and fracture.
- microstructural basis for electrical, optical and thermal properties of materials.

Quizzes and Exams

All quizzes and exams will be closed book and online. Quizzes will be given in every lecture and as part of the lecture. This usually happens 20 minutes after the start of each lecture and you cannot start the next segment until you take the online quiz. All quizzes will be online quizzes. The quizzes will be open book and notes but there is a time limit from the time that you start the quiz.

Exams: No formula sheets, other than the ones provided with the exam paper will be allowed.

DATES FOR THE EXAMS (THREE) AND THE FINAL WILL BE ANNOUNCED LATER.

Grading Policy

Exams (3)	50%
Daily Quizzes and HMWs	20%
Final Exam (Finals Week)	30%

Timing Policy

- The Modules follow a logical sequence
- Assignments are announced but not collected but may/will be included in the daily or weekly quizzes
- Quizzes must be completed during the time allotted and all lectures and quizzes should be completed by the end of the Sunday prior to the following week.
- You will have access to the course content for the scheduled duration of the course.

Attendance Policy

- This is a **live** fully in-person class.

- Log in on a regular basis to complete your work, so that you do not have to spend a lot of time reviewing and refreshing yourself regarding the content.

Plagiarism Policy

- Plagiarism is considered a serious offense. You are not allowed to copy and paste or submit materials created or published by others, as if you created the materials. All materials submitted and posted must be your own.

TOOLS Needed:

We will be using tools such as lockdown for the exams. I will be using turning point for pop-up quizzes. So, please make sure that you are prepared:

- 1- Have a computer (PC or MAC) with a webcam
- 2- Should have installed the proper tools on your computer
- 3- Contact OIT if you have any issues
- 4- Make sure that you have a reliable internet connection

Student Honor Code

All learners are expected and required to abide by the letter and the spirit of the Georgia Tech honor code.

- Review the Georgia Tech Student Honor Code www.honor.gatech.edu.
- You are responsible for completing your own work.
- Action will be taken against any learners found in violation of the Georgia Tech Honor Code.

Office of Disability Services

If needed, we will make accommodations for students with documented disabilities. These accommodations must be arranged in advance and in accordance with the Office of Disability Services (<http://disabilityservices.gatech.edu>).

Communication

- All learners should ask questions, and answer their fellow learners' questions, on the course discussion forums. Often, discussions with fellow learners are the sources of key pieces of learning.

Netiquette

- Netiquette refers to etiquette that is used when communicating on the Internet. Review the Core Rules of Netiquette. When you are communicating via email, discussion forums or synchronously (real-time), please use correct spelling, punctuation and grammar consistent with the academic environment and scholarship¹.
- Learners who do not adhere to this guideline may be removed from the course.

1. Conner, P. (2006-2014). Ground Rules for Online Discussions, Retrieved 4/21/2014 from <http://teaching.colostate.edu/tips/tip.cfm?tipid=128>

Course Materials/Textbook

- All content and course materials can be accessed on Canvas.

Recommended Textbook (as a reference): James P. Schaffer et al., The Science and Design of Engineering Materials, 2ND Ed., McGraw-Hill.

Technology/Software Requirements

- Internet connection (DSL, LAN, or cable connection desirable)
- Adobe Acrobat PDF reader (free download; see <https://get.adobe.com/reader/>)

Schedule

To be announce on canvas.