

MSE 2001E – Spring 2019
Principles and Applications of Engineering Materials
Mondays, Wednesdays, and Fridays 1:55–2:45 PM
ES&T L1225

Instructor:

Professor Dong Qin
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Office Hours: TTh (1:00–2:00 pm) or by appointment

Teaching Assistants:

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Textbook:

The Science and Design of Engineering Materials. Second edition, Schaffer et al., McGraw-Hill, Boston, 1999.

Course Objective:

Students will learn the fundamentals of structure-property-processing relationships of engineering materials; the relationship of these fundamentals to the performance of these materials; the major properties that include mechanical, chemical, and electrical, properties of materials. Students will be introduced to materials selection as part of engineering design; prepare students to undertake more in-depth courses in specialized areas within materials science and engineering. Prerequisites: CHEM 1310.

Course Website:

Canvas-GT site will be used to post course syllabus, lecture slides, homework, and homework solutions. Important announcements will also be sent to your Canvas-GT account and please visit the site frequently.

Quizzes:

To encourage students to review lecture materials and do homework on a regular basis, quizzes will be given **every Friday** during the class. Quizzes will cover any lecture material presented since the previous quiz or exam. Quizzes will not require a calculator. At the end of term, the two lowest quiz scores will be dropped. There will be no makeup quizzes.

Homework:

Problem assignments from the book will be given during the class. It is important to work on these problems individually or collectively, together with your efforts to

solicit support from the instructor and TAs. While homework will not be collected or graded, solutions will become available on Canvas-GT and some selected examples will be discussed in the class.

Exams:

There will be three exams during the semester and a comprehensive final examination. All will be closed book and closed notes. Exams will be based on lecture materials, homework, and textbook reading assignments. If a student has a legitimate conflict, a makeup exam must be rescheduled by the student **at least five business days** prior to the examination day. If a student has an emergency on the exam date, please bring a institutional excuse letter or a medical doctor note to verify that the student is not able to be on campus on the specific exam date.

Grades:

Your grade in the course will be determined based on your performance on four written examinations and weekly quizzes. The weights of the examinations are given as follows: Quizzes (15%); Exam 1, 2, and 3 (20% each); final exam (25%).

Pass/Fail:

Students who are taking the course on a Pass/Fail basis must earn a “C” or better to receive a grade of “P”.

Midterm Report:

Midterm grades are posted as “S” or “U” by September 30. A “U” will indicate unsatisfactory performance, *i.e.*, a “D” or “F”. The midterm grade will be determined by the grade on the first exam.

Attendance Policy:

Students are encouraged to attend lectures and are responsible for all materials presented during lectures.

Academic Integrity:

Students are encouraged to study together (including working together on the homework assignments). Students are to neither receive nor provide help to others during quizzes and exams.

Any student suspected of academic misconduct will be referred to the Office of Student Integrity at the Georgia Institute of Technology.

Tentative Schedule

Week Of	Monday	Wednesday	Friday
Jan. 7	Introduction (1)	Atomic Scale Structure (2)	Atomic Scale Structure (2)
Jan. 14	Atomic Scale Structure (2)	Crystal Structures (3)	Crystal Structures (3)
Jan. 21	Crystal Structures (3)	Crystal Structures (3)	Crystal Structures (3)
Jan. 28	Crystal Structures (3)	Crystal Structures (3)	Review #1
Feb. 4	Exam #1 (1-3, in class)	Point Defects & Diffusion (4)	Point Defects & Diffusion (4)
Feb. 11	Point Defects & Diffusion (4)	Point Defects & Diffusion (4)	Crystal Defects (5)
Feb. 18	Crystal Defects (5)	Crystal Defects (5)	Non-crystalline Materials (6)
Feb. 25	Non-crystalline Materials (6)	Non-crystalline Materials (6)	Review #2
Mar. 4	Exam #2 (4-6, in class)	Phase Equilibria & Diagrams (7)	Phase Equilibria & Diagrams (7)
Mar. 11	Phase Equilibria & Diagrams (7)	Phase Equilibria & Diagrams (7) Withdrawal Deadline	Phase Equilibria & Diagrams (7)
Mar. 18	Spring break	Spring break	Spring break
Mar. 25	Structural Transformations (8)	Structural Transformations (8)	Structural Transformations (8)
Apr. 1	Review #3	Exam #3 (7-8, in class)	Mechanical Properties (9)
Apr. 8	Mechanical Properties (9)	Mechanical Properties (9)	Mechanical Properties (9)
Apr. 15	Electrical Properties (10)	Electrical Properties (10)	Electrical Properties (10)
Apr. 22	Final review	Reading period	
Apr. 29	Final exam 14:40-17:30		

Important Dates

Spring Break: March 18, 20, and 22

First Exam: Monday, January 28

Second Exam: Monday, March 4

Third Exam: Wednesday, April 3

Midterm Grades: Monday, February 18

Drop Day: Wednesday, March 13

Final Exam: Monday, April 29, 14:40–17:30