

MSE 2021 Syllabus

Materials Characterization MSE 2001, Section A06, 4 Credits

Fall 2026 – Lab Section

Instructor Information

Instructor: Dr. Sarah Goodman (she/they)

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General Course Information

Description

The fundamentals of basic microstructural and compositional materials characterization techniques are presented with an emphasis on tools using electromagnetic radiation and electrons as stimuli.

Course Learning Outcomes

To teach the principals of the structural characterization of materials from atomic to microscopic scales, by presenting the theory of radiation-matter interactions, types of radiation probes for and types of characteristic signals from materials being investigated. The students will learn the operating principals of optical microscopy, x-ray diffraction and scanning and electron microscopy (SEM), as well as several complementary spectroscopies that reveal chemical information from materials. The student should complete the course with sufficient experience to utilize x-ray diffraction, optical microscope and SEM on a practical basis.

Required Course Materials

None

Grading Policy:

The lab component of the course will count for 40% of the course grade. The remaining 60% will consist of the lab grade. Please see the syllabus for MSE 2021 Section A for details about the lecture grade.

Grading for the lab component:

Labs – 62.5%

Project – 37.5%

Your final grade (weighted lecture and lab grade) will be assigned as a letter grade according to the following scale:

| | | | | | |
|--------------|--------------|---------------|---------------|---------------|---------|
| Score | 89.5% - 100% | 79.5% - 89.4% | 69.5% - 79.4% | 59.5% - 69.4% | ≤ 59.5% |
| Grade | A | B | C | D | F |

Description of Graded Components

The “lab” category can include pre-lab work, lab attendance, short lab quizzes, lab reports (formal and informal), or other relevant assessments.

The final project will include a series of smaller assessments as students prepare for their final characterization project and presentation.

Course Policies

Attendance and/or Participation

This will be an active classroom where you are expected to participate.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review [Georgia Tech’s Honor Code](#) and the student [Code of Conduct](#).

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, [contact the Office of Disability Services](#) (404-894-2563) as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. [The Student-Faculty Expectations](#) articulate some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Pre- &/or Co-Requisites

MSE 2001 Minimum Grade of D

Campus Resources for Students

Undergraduate Student Academic Success Resources:

- Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283.

Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A [comprehensive list](#) of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being ([student-resource-guide \(gatech.edu\)](#))