ME6201 CONTINUUM MECHANICS
Fall 2026

Prerequisites Introduction to partial differential equations and vector mathematics (MATH 4581 or equivalent); or with the consent of the instructor

Instructor: Prof. Min Zhou, Rm 4108 MRDC, Tel: 404-894-3294
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Office Hours: Mon & Wed 3-4 pm

TA: TBD
Email:
Office Hours:

Text Book: Introduction to the Mechanics of a Continuous Medium
by Lawrence E. Malvern, Prentice-Hall
See Modules/files on Canvas

Reference: Fundamentals of Structural Mechanics by Keith D. Hjelmstad
Prentice-Hall

Exams:

Midterm:	Wed Oct. 21, 2026, in class, 75 min, in regular classroom
Final:	Dec. 4, 2026 (Fri), 11:20am - 2:10pm, in regular classroom

Grade: Homework - 30% + Midterm - 30% + Final - 40%

A	Excellent	90%
B	Good	80%
C	Satisfactory	70%
D	Passing	60%
F	Failure	<60%

Goal: Continuum mechanics is a branch of applied mechanics that describes the behavior of solids, fluids and gases by considering them as continuously distributed media. This consideration neglects the discrete nature of matter on the atomistic or molecular levels. This course will provide knowledge of the fundamental and unifying concepts of the mechanics of continua as a core course for graduate study in Mechanical Engineering.

Class format: In classroom in-person lecture. Attendance is required and will be taken during each class and used as a gauge of effort and commitment to learning.

Recording & Zoom: Recording of lectures is available on Canvas under the Media Gallery tab as a backup resource for learning. A live Zoom link is also available under the Zoom tab. These can be used in case of absences due to genuine health

reasons or official GT functions. These resources are not a substitute for in-person class attendance.

Topics	Contents
1. Linear Algebra:	Fundamentals of tensors, tensor derivatives, Green-Gauss Theorem Reading choices: (a) Handouts on index notation, tensors and tensor algebra (b) Chapter 2, Malvern (c) Chapter 1, Hjelmstad (d) Appendix I (only as optional advanced reading), Malvern
2. Kinematics:	Definition of deformation, deformation gradient, strain & strain rates**,** Eulerian and Lagrangian coordinate systems, stretch and rotation, rate of deformation, principal strain, compatibility. Reading choices: (a) Chapter 4, Malvern (b) Chapter 2, Hjelmstad
3. Kinetics:	Definition of traction, stresses, equations of motion & equilibrium, principal stresses, deviatoric and hydrostatic stress. Reading choices: (a) Chapters 3 & 5, Malvern (b) Chapter 3, Hjelmstad
4. Constitutive Laws:	General requirements, fundamentals of hyperelastic behavior of solids, material symmetries, variational principles. Linear and nonlinear elasticity. Fundamentals of fluids, Newtonian fluids and Navier-Stokes equations, ideal and rotational flows, laminar and turbulent flow. Aspects of inelastic behavior of solids and Non-Newtonian fluids. First and second laws of thermodynamics for a continuum, coupled thermomechanics, boundary conditions. Reading choices: (a) Handouts on field equations (b) Chapters 6-8, Malvern (c) Chapters 4-7, Hjelmstad

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Policies and Expectations:

1. Students and faculty shall abide by the GT honor code for conduct which can be access at https://policylibrary.gatech.edu/student-life/academic-honor-code.
1. All class materials, resources, and announcements can be accessed at ***https://canvas.gatech.edu/***.
2. Discussions on homework and class notes are encouraged. However, exchange of written information on homework is not permitted.
3. No late homework will be accepted except for delays due to serious illness or similar difficulties, documentation is required.
4. In general, no makeup will be given for missed exams which will result in a score of zero. In case of serious illness or true emergency, email min.zhou@gatech.edu as soon as possible before the exam and provide written documentation supporting your case to request a makeup. Only genuinely valid and officially documented cases will be considered. All requests must be in writing and within two weeks of the corresponding exam. No makeup will be scheduled after the graded exam has been returned to the class and the solutions released.
5. Students are expected to check online (if electronic) or pick up (if hard copy) graded assignments/exams within one week of the release date. Regrade requests should be made within two weeks of the release date. Please check the solutions before making a request. Regrade can result in higher or lower grade.
6. Use of email for class purposes is encouraged. Students are expected to check email and the Canvas site at least twice every week.

Additional texts of interest:

1. Continuum mechanics for engineers, 3rd ed., G. Thomas Mase, R. Smelser, and G. E. Mase, CRS Press.
2. General continuum mechanics, T. J. Chung, Cambridge University Press.
3. The mechanics of thermodynamics of continua, M. E. Gurtin, E. Fried, and L. Anand, Cambridge University Press.

Attendance Policy:

This course requires scheduled class attendance which will be taken throughout the semester.

Academic Honesty/Integrity Statement:

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 the Student Code of Conduct and the Academic Honor Code.

Accommodations for Students with Disabilities:

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me the accommodation letter once you receive it.

Expectations of Faculty and Students:

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 articulates 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.