

# MTSE 3050: Mechanical Properties of Materials

## Spring 2026 Syllabus

### Credits & Classroom

<b>Course Dates</b>	01/12/2026 – 05/11/2026
<b>Lectures</b>	M/W 4:00 pm to 5:20 pm
<b>Classroom</b>	DP B157
<b>Credits</b>	3 credits

### Instructor

**Name** Dr. Dwight Burford  
[Faculty Page](#)

**Office Location** DP E215g

**Office Hours** By appointment (face-to-face or via Zoom/Teams)

**Email** [dwight.burford@unt.edu](mailto:dwight.burford@unt.edu)

**Note:** Depending upon the scope and complexity of the communication, most emails may be expected to be answered within 48 hours.

### Textbook

*Mechanical Behavior of Materials*, authored by Marc Meyers and Krishan Chawla, 3<sup>rd</sup> Edition (May 2025) – Hardcover ISBN-13: [9781108837903](#), eBook available.

Additional reference texts and materials:

- *Mechanical Behavior of Materials: Deformation and Design*, 1st Edition ([July 2, 2025](#)) by Rajiv S. Mishra, Indrajit Charit, Ravi Sankar Haridas, Paperback ISBN: 9780128045541; eBook ISBN: 9780128029596
- *Mechanical Behavior of Materials*, by Thomas Courtney, 2nd edition, (2005) ISBN 978-1-57766-425-3
- *Mechanical Behavior of Materials*, by William F. Hosford, 2nd edition, (2010) ISBN 9780521195690
- Supplemental materials included in lecture slides and handouts.

### General Course Information

- Course Content (catalog description): Macroscopic mechanical response of ceramics, metals, polymers, and composite materials, with an introduction to the underlying microstructural processes during deformation and fracture.
- Prerequisites or co-requisites: MTSE 3000

## Course Goals

**Specific Outcomes of Instruction:** In this course, students will learn scientific and engineering principles and methods related to understanding and evaluating mechanical responses of materials to loading under different conditions. Topics include both macroscopic and microscopic concepts and evaluation techniques. A focus will be on correlations between material microstructure and mechanical properties. Lectures will cover topics listed in the *Course Topics* section, and homework will be assigned to both instruct and evaluate the progress of students in learning the concepts presented.

### Student Outcomes Listed in ABET Criterion 3\* and Other Outcomes Addressed in Course

Specific Course Learning Outcome	Student/ABET Outcome*						
	1	2	3	4	5	6	7
1. Students will learn about correlations between microstructure and mechanical properties.	X						
2. Students will be given instructive homework assignments and exams throughout the term to exercise and increase their knowledge of the mechanical behavior of materials in response to various loading conditions.	X						

\*ABET Accreditation: <https://materials.engineering.unt.edu/accreditation>

## Grading

- Homework and Quizzes .....30%
- Attendance .....10%
- First exam.....20%
- Second exam .....20%
- Final .....20%

An “A-F” grading scale will be used. The point percentages used to calculate the final grade are:

**A: 90-100 | B: 80-89.99 | C: 70–79.99 | D: 60–69.99 | F: 0–59.99**

## Assignments

The instructions for assignments and their due dates will be posted on *Canvas*.

- Homework must be turned in on paper by the beginning of the assigned class period.
- Exam grades are expected to be posted within 2 weeks after an exam is administered.
- Students are expected to participate in class discussions related to course assignments as specified in class or in the rubric posted to *Canvas*.

Note: The University is committed to providing reliable online course systems to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents

students from completing a time sensitive assessment activity, the instructor will extend the time windows and provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and contact the UNT Student Help Desk: [helpdesk@unt.edu](mailto:helpdesk@unt.edu) or 940.565.2324 and obtain a ticket number. The instructor and the UNT Student Help Desk will work with the student to resolve any issues at the earliest possible time.

## Course Topics

The course subjects will be based primarily on material covered in the following chapters of the course text. Selected topics from the chapters not listed will also be reviewed.

**Chapter 1.** Materials: Structure, Properties, and Performance

**Chapter 2.** Elasticity and Viscoelasticity

**Chapter 3.** Plasticity

**Chapter 4.** Imperfections: Point and Line Defects

**Chapter 5.** Imperfections: Interfacial and Volumetric Defects

**Chapter 6.** Geometry of Deformation and Work-Hardening

**Chapter 7.** Fracture: Macroscopic Aspects

**Chapter 8.** Fracture: Microscopic Aspects

**Chapter 9.** Fracture Testing

**Chapter 13.** Creep and Superplasticity

**Chapter 14.** Fatigue

**Chapter 15.** Composite Materials

## Course Policies

### 1. Academic Integrity Standards & Sanctions for Violation

Students caught cheating or plagiarizing will be reported to the Dean of Students. According to the UNT policy, the term “cheating” includes, but is not limited to: a) use of any unauthorized assistance in taking quizzes, tests, or examinations; b) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; c) the acquisition, without permission, of tests or other academic material belonging to a faculty or staff member of the university; d) dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s); or e) any other act designed to give a student an unfair advantage. The term “plagiarism” includes, but is not limited to: a) the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and b) the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

## 2. ADA Statement

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the Office of Disability Accommodation website at [disability.unt.edu](https://disability.unt.edu)

## 3. Emergency Notification & Procedures

UNT uses a system called Eagle Alert to quickly notify you with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). The system sends voice messages (and text messages upon permission) to the phones of all active faculty staff, and students. Please make certain to update your phone numbers at [my.unt.edu](https://my.unt.edu). Some helpful emergency preparedness actions include: 1) know the evacuation routes and severe weather shelter areas in the buildings where your classes are held, 2) determine how you will contact family and friends if phones are temporarily unavailable, and 3) identify where you will go if you need to evacuate the Denton area suddenly. In the event of a university closure, please refer to [Eagle Alert and @UNTEagleAlert](#) for contingency plans for covering course materials.

## Artificial Intelligence (AI) General Policy

- AI may be used in this course for the study of the mechanical properties and behavior of materials.
- **In the event that data derived from AI is included in the answers to an assignment, proper attribution of AI must be clearly included.**
- For example, information and data acquired through open AI chatbots (programs), such as ChatGPT, Grok, Gemini, etc., must be cited and/or referenced clearly.
- Specifically, the following requirements must be met:
  - First, include the question and/or information input to prompt the AI chatbot.
  - Second, clearly quote the relevant output from the chatbot or similar program.
- While AI is used in most word processing programs, e.g. MS Word, you may not use AI chatbots to generate your assignments.
  - All material from a chatbot must be clearly identified as referenced material, not represented as your own work.
  - Any report content that is AI generated that is not properly attributed (referenced) will be treated as plagiarism.