MTEN 201 – HM1 (*Honors Section*)
Introductory Principles of Materials Engineering
Fall 2025 Syllabus

Instructor: Dr. Kathleen McEnnis
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She/Her/Hers pronouns
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Zoom Room:
https://njit-edu.zoom.us/j/2945567196?pwd=OGlQcVZLeUlycFM2MEZvcWtaQk1OZz09
Office Hours: Wednesdays 12:00pm – 1:00pm. Schedule an appointment through email. Additional times available – please email to schedule.

Teaching Assistant: Shima Baloochestanzadeh (sb2936@njit.edu)

Required eTextbook (Online Subscription Required): WileyPLUS: Fundamentals of Materials Science and Engineering: An Integrated Approach, 6th Edition, W.D. Callister, Jr., and D.G. Rethwisch, John Wiley and Sons, Inc.

ISBN:
9781119764816 ~ WileyPLUS one-term access
or
9781119750499 ~ WileyPLUS one-term access + loose leaf text

Class: Monday 10:00 AM-11:20 AM Room FMH 413
Friday 10:00 AM-11:20 AM Room FMH 413

Course: This course introduces the basic concepts of Materials Engineering, and covers introductory topics including structure, property, performance, and processing of materials. This course focuses on conventional materials including metallic materials and their alloys, ceramics, polymers, and composites. Relationship between structure and material properties, such as mechanical, electronic, thermal, optical, magnetic, and electrochemical, are investigated with a particular interest on ways to engineer material structures to produce desired set of properties. Broader themes associated with the property, processing and performance of materials that influence the economy, environment, and society are discussed.

Prerequisites: CHEM 126, PHYS 121 or PHYS 122, MATH 112.

Withdraw Deadline: November 10, 2025

Course Administration: Administration of this course will be done through Canvas where links to the WileyPLUS platform can be found.

Assignments: Homework assignments will be given using WileyPLUS or otherwise posted on Canvas. In class practice problems will also occasionally be assigned and will contribute to the assignment grade. Homework assignments (and practice problems) are graded and will be 10% of the overall grade. While the in-class practice problems can be worked on with other students, the WileyPlus assignments must be completed independently.

Quizzes: Quizzes will be given in class. Quizzes are closed book & notes, though an equation sheet will be provided. Quizzes are 20% of the total grade and the lowest quiz grade will be dropped.

Exams: There will be two exams and one final. The exams are each worth 20% of the total grade and the final is worth 30% of the total grade. All exams and finals will be closed book & notes, though an equation sheet will be provided.

Extra Credit: Weekly exit questions related to the topics discussed in class that week can be submitted each week for an opportunity for extra credit. Submitting one question a week will add 5 points to that week's homework assignment score. The best question for the week (as determined by the instructor) will receive 10 points to the week's homework assignment.

GRADING

Assignments		10%
Quizzes		20%
Exams		40%
Exam 1	20%	
Exam 2	20%	
Final		30%
		100%

Grades will be based on:

A: 90 – 100%
B+: 85 – 89%
B: 80 – 84%
C+: 70 – 79%
C: 60 – 69%
D: 50 – 59%
F: 0 – 49%

Makeup Policy: No makeup exams, finals, or quizzes will be granted unless the Dean of Students contacts me about your reason for missing and the reason is deemed suitable.

Late Work Policy: Assignments will not be accepted late unless there is an extenuating circumstance documented through the Dean of Student's office.

Electronic Device Policy: With the exception of calculators, the use of electronic devices during exams, finals, or quizzes is prohibited. The use of an electronic device during class time is allowed and you are encouraged to bring a personal electronic device to class to participate in PollEverywhere questions and access your WileyPLUS materials. Please be aware, however, that though these devices can aid in your learning experience, they can also be a source of distraction for both you and your peers. Use your electronic devices responsibly so as not to distract yourself or others from the class.

Academic Integrity Policy: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: https://t.e2ma.net/click/zzkslnb/fwo9novf/bpod05x.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

This course expects students to work without artificial intelligence (AI) assistance in order to better develop their skills in this content area. As such, AI usage is not permitted throughout this course under any circumstance.

Use of "homework help" sites such as Chegg.com to complete class work is prohibited. Any student found to have used one of these sites on an assignment will be reported to the Dean of Students Office for a potential academic integrity violation.

Course Objectives: Students will be able to:

1. name types of bonding in materials and identify which materials exhibit each of these bonding types
2. identify the structures of metals and ceramics
3. identify the chemical and structural characteristics of polymers
4. define types of imperfections and the roles they play in affecting the behavior of materials
5. design structures/components using predetermined mechanical properties and mechanical constraints and/or safety constraints
6. identify deformation and strengthening mechanism for materials
7. interpret phase diagrams for determination of phases present and computation of phase compositions and amounts
8. apply phase diagrams for development of microstructures in alloys
9. apply phase transformations concepts to determine microstructure
10. draw relationship between microstructure and mechanical properties
11. select appropriate materials for various applications
12. identify economic, environmental and societal issues in materials design and selection

Topics & Dates (may be subject to change)**:**

1. Introduction — Chapter 1
2. Atomic Structure & Interatomic bonding — Chapter 2
3. Metallic/Ceramic Structures — From Chapter 3

Quiz 1 Monday, September 22

4. Polymer Structures & Polymer Cryst., Melting, Tg — From Chapter 4 & 11

Exam 1 Monday, October 6

5. Imperfections in Solids — From Chapter 5
6. Mechanical Properties — Chapter 7

Quiz 2 Monday, October 20

7. Deformation/Strengthening Mechanism — Chapter 8

Exam 2 Monday, November 3

8. Phase Diagrams — Chapter 10

Quiz 3 Monday, November 17

9. Phase Transformations — Chapter 11

Quiz 4 Monday, Dec 1

10. Economic, Environmental and Social Issues — Chapter 20

Final Exam TBA (will take place during the Dec 14 - 20 Final Exam period)

Honors Students:
Students registered for the honors section will be given an additional project for the H, which will be based on Chapter 20. Students will be expected to prepare a presentation on the selected topic, including information from the textbook, but also including a deep dive into the topic using other sources. A rubric will be provided by the instructor. Students will be expected to meet with the instructor 2-3 times to finalize the presentation. Students will also provide questions (and answers) about the topic that the presentation will answer. Grading will be based on overall presentation and content. Presentations in the 'Excellent' and 'Proficient' range will receive an H for the class.

Deadlines:
Slides of a longer outline version of the presentation are due **Mon Dec 1st**.
Questions (with answers) about your presentation are due **Fri Dec 5th**.
In class presentations are on **Mon Dec 8th**.

Disability Support Services
If you need accommodations due to a disability please contact Chantonette Lyles, Associate Director of Disability Support Services, Fenster Hall Room 260 to discuss your specific needs. A Letter of Accommodation Eligibility from the Disability Support Services office authorizing your accommodations will be required.