

MECH 2606 - Engineering Materials

Fall 2026 Syllabus, Section 02, CRN 41143,

Credit hours: 3

Instructor

Constantin Solomon

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Public Instructor Information

Instructor Title: Professor

Instructor Professional Qualifications:

Post-doctoral, Arizona State University, 2002-2007

Ph. D., Materials Science and Engineering, Kumamoto University, 2002

BS/MS, Mechanical Engineering, Gh. Asachi Technical University of Iasi, 1990

Instructor Office Location: Moser Hall, Room 2500

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Course Description

2606. Engineering Materials. Properties and uses of engineering materials, manufacturing processes, including heat treatments and forming operations. Introduction to mechanical testing methods. Listed also as MTEN 2606. Prereq.: MATH 1571 or MATH 1585H. 3 s.h.

Course Readings

Group	Title	Author	ISBN
Required	Materials Science and Engineering, An Introduction	W.D. Callister, Jr. and D.G. Rethwisch	978-1-119-40540-5
Required	Handbook for Technical Document Preparation	Mechanical Engineering Program, YSU	

1. W.D. Callister, Jr. and D.G. Rethwisch (2018) *Materials Science and Engineering, An Introduction*, 10th Ed., John Wiley & Sons.

Digital edition with WileyPLUS resources is recommended. The digital edition with WileyPLUS resources is available for purchase via Blackboard. For information on purchasing the digital edition, please see the following document on Blackboard's Course Content: *How to access your WileyPLUS digital textbook?*

2. *Handbook for Technical Document Preparation*, Mechanical Engineering Program, Rayen School of Engineering, College of STEM, Youngstown State University (2023) Second Edition, Edited by Prof. S. I. Moldovan, Ph.D.

An electronic copy of the Handbook is available on the Blackboard, see Blackboard's Course Content.

The course readings are subject to change in the event of extenuating circumstances, research developments, current events, and/or to ensure better learning.

Schedule of Topics and Assignments

Week of	Reading(s)	Proposed Topic	Due/To Prepare for Class
8/24	Chapter 1	Introduction	Homework due next lecture/ Readings, Question and Problems at the end of chapter

8/31	Chapter 2	Atomic Structure and Interatomic Bonding	Homework due next lecture/ Readings, Question and Problems at the end of chapter
9/7	Chapter 3 Engineering Materials Project	The Structure of Crystalline Solids Selected advanced engineering material	Homework due next lecture/ Readings, Question and Problems at the end of chapter Project report due in Blackboard 9/18, 5:00 PM
9/14	Chapter 3	The Structure of Crystalline Solids	Homework due next lecture/ Readings, Question and Problems at the end of chapter
9/21	Chapter 4 Engineering Materials Project	Imperfections in Solids Selected advanced engineering material	Homework due next lecture/ Readings, Question and Problems at the end of chapter Project report due in Blackboard 10/02, 5:00 PM
9/28	Chapter 5	Diffusion Exam 1	Homework due next lecture/ Readings, Question and Problems at the end of chapter Exam 1 - questions and problems from Chapters 1 to 4
10/5	Chapter 6 Exploring Engineering Materials Project	Mechanical Properties of Metals Selected advanced engineering material	Homework due next lecture/ Readings, Question and Problems at the end of chapter Project report due in Blackboard 10/16, 5:00 PM
10/12	Chapter 6 Chapter 7	Mechanical Properties of Metals Dislocations and Strengthening Mechanisms	Homework due next lecture/ Readings, Question and Problems at the end of chapter
10/19	Chapter 7 Exploring Engineering Materials Project	Dislocations and Strengthening Mechanisms Selected advanced engineering material	Homework due next lecture/ Readings, Question and Problems at the end of chapter Project report due in Blackboard 10/30, 5:00 PM
10/26	Chapter 8	Failure Exam 2	Homework due next lecture/ Readings, Question and Problems at the end of chapter Exam 2 - questions and problems from Chapters 5 to 7
11/2	Chapter 8 Exploring Engineering Materials Project	Failure Selected advanced engineering material	Homework due next lecture/ Readings, Question and Problems at the end of chapter Project report due in Blackboard 11/13, 5:00 PM
11/9	Chapter 9	Phase Diagrams	Homework due next lecture/ Readings, Question and Problems at the end of chapter
11/16	Chapter 9	Phase Diagrams	Homework due next lecture/ Readings, Question and Problems at the end of chapter
11/23	Chapter 10	Phase Transformations: Development of Microstructure and Alteration of Mechanical Properties	Homework due next lecture/ Readings, Question and Problems at the end of chapter
11/30	Chapter 11	Applications and Processing of Metal Alloys	Homework due next lecture/ Readings, Question and Problems at the end of chapter

12/7

Final Exam, Monday, December 7, 2026,
10:30 AM - 12:30 PMComprehensive exam - questions and
problems from all chapters

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