



Course Syllabus
SEMESTER
School of Science, Technology, Engineering, and Mathematics

Course Name	Material Science
Course & Section Number	MET130-XXX
Meeting Day(s) & Time(s)	
Credits	3
Contact Hours	5 (Lecture: 2, Lab: 3)
Instructor's Name	
Office Hours & Location	
OCC Phone:	
OCC Email: *	

* Please use only Owens email for course communications.

Catalog description

Examines engineering materials including manufacture, structure and physical properties, analysis and interpretations of diagrams and curves, heat treatment of steels, non-ferrous metals and alloys, non-metallic materials, the study of microstructures and other related principles. Lab consists of metallurgical sample preparation and use of the metallographic and metallurgical microscopes as well as other experiments using the principles learned in the classroom.

Prerequisite/Corequisites

MTH 096 – Intermediate Algebra; or
MTH 143 – Applied Industrial Mathematics; or equivalent

Course Materials

Engineering Materials: Properties and Selection, 9th Ed.
by Budinski & Budinski
ISBN13: 9780137128426
Format: Text book
Publisher: Pearson

If a **print book, e-book, or access code** is required for class, you can access the Owens Community College e-Campus Bookstore by accessing the online link, called “Find Books” on the course schedule for each course section. See the example below.

Course		Course Title				Credit Hrs.	Course Fees	Seats	
Academic Period		Academic Period Dates		Class Type	Course Links				
Days	Times		Room Dates	Instructor	Meeting Type	Building/Room	Location		
SKT131-002		Electrical Prints				3	\$0	20	16
2025 Fall Semester		2025-08-25 - 2025-12-11		Face-to-Face	[Course Info] [Find Books]				
T	8:00 AM - 10:40 AM		2025-08-25 - 2025-12-11	Todd Schick	Lecture	DC 111	Toledo		
Last day to add: Aug 29, 2025 -- Last day to drop: Dec 11, 2025									
Refund deadlines: Aug 29, 2025 (100%) -- Sep 05, 2025 (60%) -- Sep 12, 2025 (50%)									

OER and Owens Community College Library Resources (Open Educational Resources are free online materials for instructor and student use. Some OER material may be available in print in the Owens Community College Library.)

Inclusive Access (I.A.) Materials are included in the cost of the course to save students money through lower negotiated rates with publishers. Courses containing I.A. materials will have it noted on the online class schedule. If your course includes I.A. digital materials, you will receive an email with subject line, “Your inclusive Access Materials,” and it will include any codes or digital links.

The email will come to your Owens Community College email from the Owens e-Campus Bookstore on the first day of class, if not before. Be sure to check your spam (junk email) if you do not find it in your inbox. If the email is not in your inbox or spam folder, contact your instructor immediately. You may also see a folder at the top of your course labelled “Course Materials by eCampus.” This folder will contain any needed codes or links to needed materials.

If the I.A. materials also include a printed book or are in print form, the item will be shipped to your address of record automatically based on your enrollment in the course. Please note that some courses do not include printed materials in I.A and those materials would need to be purchased separately using the link on the course schedule. When you access the Find Books link you will see which items in a course are included in I.A.

What You Will Learn in the Course

Course Objectives

1. This course will provide an overview of physical and chemical properties or engineering materials.
2. This course will instruct the student in use of hardness testers, tensile testers and other engineering equipment.
3. This course will provide the student with the ability to perform basic materials selection based on upon their properties and application.
4. This course will incorporate industry standard safety practices.

Student Learning Outcomes

Students will:

Outcome	Where Assessed
1. List how engineering materials, metals, polymers, ceramics, and composites are related in origin and structural characteristics (crystal structure, organic composition and properties, basic chemistry and atomic structure)	CH 1-4 Lab 1 BB 1
2. List the properties that must be reviewed when making materials selections (modulus of elasticity, tensile strength, yield strength, shear strength)	Ch 3 & Ch4 Lab 4 BB 2
3. Differentiate between the properties of stiffness, strength, and toughness (stiffness - modulus, strength - tensile strength, yield, shear strength).	Test 1 Lab 4 BB 3
4. Define vocabulary used in steel terminology.	Test 1 Lab 5 BB 3
5. Describe how steels are made (melting, casting, hot rolling, cold rolling).	Ch 12 Test 1 BB 4
6. List and describe the common heat treatments used on steels (annealing - heat and slow cool, quenching - fast cooling, tempering - low temperature reheating).	Ch 13 Test 2 BB 4 Lab 6
7. Describe how cold working and alloy additions alter steel properties (increase strength, lower ductility).	Ch 14 Lab 6 BB 5 & BB 6
8. Specify tool steels based upon their properties and the heat treatment to which they have been subjected (evaluate operating temperature, strength, stiffness, cyclic loading).	Ch 15 Lab 6 BB 6
9. Understand the basic characteristics of polymers, aluminum, and copper.	Ch 7 – 11 & Ch 18 – 20 Lab 8 & Lab 10 BB 9-12 Test 3

Institutional General Education Competencies

As a student at Owens Community College, you will take General Education courses as part of your degree program. While specific to the General Education courses, will be reinforced in

many of your degree program major courses and may be measured in your capstone course(s) and others as identified.

Competency	Where Assessed
Communicate effectively.	Lab time & reports
Act with professional responsibility.	Lab & class time
Think analytically, critically, and creatively.	Lab time & tests

Academic Support

Disability Services

If you have a disability or acquire one, you may be entitled to receive reasonable accommodations intended to assure you an equal opportunity to participate in and benefit from the program. To receive more information or to register for accommodations, please contact the Disability Resource Center at 567-661-7007, email disability@owens.edu, visit <https://www.owens.edu/disability/>, or stop by College Hall 116.

Tutoring Services

Owens Community College offers academic tutoring and assistance in a variety of subjects including: accounting, computing, economics, mathematics, science, and writing. For more information go to: <https://www.owens.edu/successcenters/>

Counseling Services

Owens Community College provides assistance to students experiencing personal, educational, interpersonal/relationship, family, social, or psychological difficulties. If you feel you may benefit from this service, please contact them at counselingservices@owens.edu. More information is at <https://www.owens.edu/counseling/>

Campus and Community Connections

The Center for Campus and Community Connections (College Hall 151) is a walk-in office created to provide retention support through resource stability initiatives and community connections. Go here for more information: <https://www.owens.edu/connection/> or contact connections@owens.edu

Owens Library

The Owens Library offers two locations (Toledo and Findlay) as well as online resources. For more information visit <https://www.owens.edu/library/>.

General Information

Student Code of Conduct

All students are expected to follow Owens Community College's Student Code of Conduct, which includes academic honesty, encompassing plagiarism. See the Board Policy for more information. If you are unfamiliar with the Student Code of Conduct and Board Policy on academic honesty and plagiarism, they can be found at:

Student Code of Conduct: www.owens.edu/conduct/

Board Policy: www.owens.edu/media/trustees/board_policies/11-2-33.pdf

Anti-Discrimination and Harassment & Title IX/Sexual Misconduct

All students, faculty, and staff are expected to follow Owens Community College's Anti-Discrimination and Harassment Policy and the College's Title IX/Sexual Misconduct Procedures and Guidelines. The College strictly prohibits and will not tolerate harassment, discrimination, intimidation, or hostile/offensive working or learning environments.

If you are unfamiliar with the Anti-Discrimination and Harassment Policy, it can be found at: https://www.owens.edu/media/trustees/board_policies/11-4-17.pdf

If you are unfamiliar with the Title IX/Sexual Misconduct Procedures and Guidelines, it can be found at: <https://www.owens.edu/trustees/wp-content/uploads/sites/45/2020/08/11-4-17-Title-IX-Sexual-Misconduct-Procedures-and-Guidelines.pdf>

Religious Accommodations

A student seeking an accommodation for an absence permitted under Ohio's Testing Your Faith Act must provide the instructor with a written email notice with the specific dates for an absence, and must do so not later than fourteen (14) days after the first day of instruction. Alternative accommodations are not retroactive, and no academic penalty will be imposed for an absence under the policy*. The request for an alternative accommodation will be kept confidential. Students with questions about a religious accommodation under Ohio's Testing your Faith Act may contact the College's Office of Academic Affairs: provost@owens.edu

The policy may be found on the Owens website: [3358:11-2-63](#) - Accommodation for a Student Absence for the Observance of Religious Beliefs and Practices Policy.

Document Collection

Throughout the semester, your instructors may ask for a variety of assignments including tests and/or quizzes for student learning of institutional general education competencies or program assessment. Please save all your class materials until the end of the semester.

Classroom Admittance

OCC classes shall only be attended by the officially registered OCC students or prospective students, instructor of record, guest lecturer, or substitute. Visitors are not permitted to be in the classroom and should not be invited to attend or participate in the class. See Family Educational Rights and Privacy Act (FERPA) regulations for more information: <https://studentprivacy.ed.gov/ferpa>

Use of AI Tools

This course requires you to complete various assignments that assess your understanding and application of the course content. You are expected to do your own work and cite any sources you use properly. You are not allowed to use any artificial intelligence (AI) tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, to complete any part of your assignments. Any attempt to use these tools will be considered academic misconduct and will be dealt with according to the Owens Community College academic integrity policy. Students are expected to complete all work independently and without the assistance of AI-generated content.

If you have any questions about what constitutes acceptable use of AI tools, please consult with the instructor *before* submitting your work.

Student Responsibilities & Instructor Expectations

Student Responsibilities

1. Students are expected to conduct themselves in a professional manner during class and lab. It is expected that you will treat me and other students respectfully, participate actively, and refrain from distracting behavior, such as:
 - Using electronic devices for non-class activities (phones, laptops, etc.)
 - Working on homework or other class work during lecture or class discussions
 - Slouching, putting head down, sleeping, etc.
2. The student is responsible for obtaining any missed notes, handouts or assignments, and turning them in on time. Lecture notes will generally be available on Blackboard.
3. Students who added the class after the first day are responsible for arranging for the missed work to be made up.
4. Class attendance is not mandatory but is recorded. Participation in class and labs is expected and counts to the final grade.
5. No labs can be handed in past the last regular class day.
6. Tests, assignments and labs will be scheduled at the discretion of the instructor. Changes from the schedule given in this syllabus will generally be communicated in class at least a week before the test.
7. All general rules presented in the student handbook will be observed. If plagiarism is detected on a written assignment or lab report, you will receive a zero for that assignment. If it is detected a second time, you will fail the course.
8. NO direct copying and pasting into your lab
9. Classroom attire will be casual.
10. If you have an issue that may interfere with this class, early communication is important to allow solutions to be implemented.

Instructor Expectations

Class will be split into two parts: Lecture and Lab. Homework and tests will be provided online via Blackboard. Any changes to class time or location will be communicated via Owens email as soon as possible.

Classroom Environment

No work can be conducted in the lab unless the instructor has given the go ahead and is in the room. No smoking (including vaping), chewing (tobacco or otherwise), eating, or drinking.

How Grades are Determined and Major Assignments

Grading Procedure

Evaluation Measure The grade points for the areas of work are as follows.	Student Learning Outcomes Assessed	Value
BB HW 11x10pts	1-9	110 points
Labs reports 12x35pts	1-9	420 points
Tests x 3	3-5 & 9	300 points
Final exam	1-9	120 points
Attendance & Participation		50 points
Total		1000 points

The final course grade is to be computed using the following weights:

Evaluation Measure	Value	Student Learning Outcome Assessed
Homework:	11%	1-9
Labs reports:	42%	1-9
Tests x 3:	30%	3-5 & 9
Final Exam:	12%	1-9
Class Attendance & Participation:	5 %	

Grade	Points
A	900-1000
B	800-899
C	700-799
D	600-699
F	0-599

Grades will be calculated on the following scale:

90% and Above	A
80% to 89%	B
70% to 79%	C
60% to 69%	D
Less Than 60%	F

	Lecture Topic	Reading	Lab Topic	Lab Due
	DATE			
1	Engineering Materials Forming Eng Materials	Chapters 1- 2	Crystal Structure Lab Lab Report Structure	
	DATE			
2	Chemical and Mechanical Properties Chapters 3 & 4	Chapters 1- 4	Hardness Testing	Crystal Structure
	DATE			
3	Steel Products Test 1 Review	Chapter 12	Rubber Band Diagram Const	Hardness Testing
	DATE			
4	Heat Treatment of Steel	Chapter 13	TEST 1	Ch 1-4, & 12
	DATE			
5	Carbon & Alloy Steel	Chapter 14	Tensile Test Lab	Rubber Band
	DATE			
6	Tool Steels	Chapter 15	Digital Vision Metallograph	Tensile Test
	DATE			
7	Stainless Steel	Chapter 16	Heat Treating	Digital Metallograph
	DATE			
8	Cast Iron / Powdered Metal	Chapter 17	Complete Heat Treating Identify Cast Iron	
	DATE			
9	Copper & Aluminum & Alloys Test 2 Review	Chapters 18 & 19	TEST 2	Ch 13-17
	DATE			
10	Nickel, Zinc, Magnesium, & Refractory Materials	Chapter 20	Brass Lab	Heat Treat Steel Identify Cast Iron
	DATE			
11	Principles of Polymeric Mat Polymer Families	Chapters 7 & 8	Metallographic Sample Preparation	Brass Lab
	DATE			
12	Plastic/Composite Fabrication Selection of Plastics	Chapters 9 & 10	Impact Testing	Metallographic Sample Preparation
	DATE			
13	TEST 3	Ch 18-20, 7-10	Aluminum Casting Part 1	
	DATE			
	DATE			
15	Ceramics, Cermets Surface Engineering, Review	Read Chapters 11 & 21	Aluminum Casting Part 2 Material Selection	Impact Testing
	DATE			
16	FINAL - All Material		Last day to turn in any work	Aluminum Casting

Disclaimer: The instructor reserves the right to amend this syllabus as deemed necessary and will communicate such amendment to the students in the course. Please note that while unlikely, there is a possibility courses might need to change the delivery method due to external issues like public health concerns, weather issues, etc. If this happens, the college will communicate any changes via email and/or other communication methods.