

Miami University
School of Engineering and Applied Science
Department of Engineering Technology

ENT 151	ENGINEERING MATERIALS	3
Course Number	Title	Credit Hours

DESCRIPTION: This course will provide the student with a basic understanding of materials and the important practical considerations that must be used in material selection and specification in design, manufacturing and failure analysis.

PERIODS PER WEEK: 2 Lecture 1 Lab. This course is taught in Hamilton and is broadcast to Middletown via IVDL. You are free to attend at either campus. I will be in Hamilton most of the time but will occasionally teach from Middletown. You will be made aware of the teaching schedule each week.

PREREQUISITE(S): none, **CO-REQUISIRE(S):** none

TEXT:

“Engineering Materials Properties and Selection” eighth edition

K.G. Budinski and M.K. Budinski Prentice Hall 2005 ISBN #0-13-183779-6

METHOD OF PRESENTATION:

Class lectures, videotapes, laboratory, recitation, and demonstrations **Labs and additional information are on ENT server <http://ent.ham.muohio.edu>**

METHOD OF EVALUATION:

The following is a breakdown of the distribution of the grading:

Exams	30%
Lab Reports	15%
Homework	10%
Notebook	15%
Paper/Presentation	10%
Final Exam	10%
Class Participation	<u>10%</u>
Total	100%

Homework assignments, lab reports, notebooks and papers will be due on the assigned date. Work will not be accepted later than the next class meeting unless a prior arrangement has been made.

GRADING:

A short weekly lecture / discussion will be followed by a three hour laboratory session during which students will complete laboratory projects. These projects will be drawing assignments that demonstrate the tools discussed in the assigned chapters from the text. Generally, drawings will be due one week after the assignment. The assignments will be submitted to the professor in both hard copy and on a floppy disk. The returned drawings are to be kept and organized in a notebook. A midterm and final exam will be given.

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
>91	89>	87>	84>	84>	79>	77>	70>	67>	64>	60>	<60
	X	X	X	X	X	X	X	X	X	X	
	<91	<89	<87	<80	<77	<74	<74	<69	<67	<64	

OBJECTIVES:

Upon successful completion of this course the student will have an understanding of the following:

- How to think and where to find information specifically associated Engineering Materials.
- The basic properties and practical applications of metals, ceramics polymers and composites.
- The properties and characteristics that must be considered when using and specifying materials for design and fabrication purposes.
- Iron and steel terminology, processes, specifications and heat treatments.

OBJECTIVES (cont.):

- The terminology, processes, specifications and heat treatments of aluminum, copper, and other metal alloy systems.
- The numerous specification organizations and how to obtain copies of their specs.

COURSE ASSESSMENT CRITERIA

This course is a constitute course and is therefore not directly assessed. It will contribute to **Outcome 2** “Fundamental knowledge of engineering materials and how these materials are used in the design of machine components and systems” which is assessed in ENT 278. It will also contribute to **Outcome 4** “Fundamental knowledge of modern manufacturing methods, especially in the areas of machining, quality control, and process control” which is assessed in ENT 252

ASSESSMENT TOOLS USED IN ENT 278 AND ENT 252

Employer Surveys
Graduate Surveys
Student Evaluations
Design project and test outcomes from 278 and 252

MIAMI UNIVERSITY LEARNING COMMUNITY:

Miami University is committed to fostering a supportive learning environment for all students irrespective of individual differences in gender, race, national origin, religion, handicapping conditions, sexual preferences, or age. Students should expect, and help create, a learning environment free from all prejudice. Disparaging comments, sexist or racist humor, or questioning the academic commitment of students based upon these individual differences are behaviors that undermine our learning community. If such behaviors occur in class, please seek the assistance of your instructor or department chair.

TOPICAL OUTLINE:

<i>Week</i>	<i>Chapter and Topic</i>	<i>Homework</i>	<i>Labs</i>
1	Introduction		
2	Chapter 1 - Structure & Properties	2,7,11,14,15, 16,18,21,23	
3	Chapter 1 and 2 - Properties and Selection		Lab 1
4	Chapter 2 (cont.) & Test 1	1,4,5,7,8,9,11,16,17,18,19,23	
5	Chapter 9 - Steel Products		Lab 2
6	Chapter 9 (cont.)	5,7,8,12-18,20,21,24-26	
7	Chapter 10 - Heat Treatment of Steels	3,7,8,16,19,20,21,26,27,44	Lab 3
8	Chapter 11 Carbon and Alloy Steels		
9	Chapter 11 (cont.)	1,9,10,11,17	
10	Test 2		Lab 4
11	Chapter 14 Stainless Steels. Test 3 (Take Home)	2,7,11,13,14,20,24	
12	Chapter 4 Polymers	6,13,14	
13	Chapter 5 Polymer Families	1,9,10,16,19,23	Lab 5
14	Chapter 6 Polymer Fabrication	Pages 183-189	
15	Chapter 7 Polymer Selection		
16	Term Paper Presentations and Review		
17	Final Exam		

Notes (1) Additional labs will be done as they fit the schedule during the semester, (2) The labs classes will be held on the Middletown Campus (Room 10 Thesken) and off campus due to equipment location, (3) Labs and additional information are on ENT server <http://ent.ham.muohio.edu>