

**Department of Engineering & Technology Education
College of Engineering
Utah State University**

Course Title: Material Processing and Tooling Systems
Course Number: ETE 1030
Semester Credits: 3
Prerequisite: none
Lab Fee: \$30 for consumables (materials, tools, and components)
Instructor: Andrew Deceuster
Office: IS 003
Phone: (435) 797-1796
E-mail: a.deceuster@aggiemail.usu.edu
Address: Utah State University
ETE Department
6000 Old Main Hill
Logan, UT 84322-6000

Date: Spring 2009
Course Time: Section 001 Lecture and Lab MWF 10:30-12:20 rm. IS 117
Lab rm. IS 114
Office Hours: Arranged by appointment

Course Description

An introduction to properties, production, and history of industrial materials (metallic, polymeric, ceramic, and composite), processes used to produce standard stock and finished products, and the use of precision measuring instruments in manufacturing.

Course Objectives

This course is designed to explore the materials, processes, and tooling systems used in the manufacturing industry. At the conclusion of the course, the student will be able to:

1. Understand the basic historical developments in manufacturing technology and their social/cultural impacts.
2. Categorize materials and processes used in manufacturing.
3. Identify various materials and their properties used in manufacturing.
4. Select materials and processes for specific manufacturing applications.
5. Operate a variety of tools and equipment to process materials used in manufacturing technology.
6. Make precision measurements using micrometers, Vernier height gages, dial calipers, and dial indicators.
7. Understand the use of tolerances and fits in manufacturing.
8. Understand the basic design concepts in the development of tooling (jigs and fixtures).
9. Understand the use of statistics in manufacturing.

Class Schedule

Lecture	Reading	Quizzes
Safety Presentation		
Historical Presentation		
Casting, Lathe Bit, demo		safety
Labor Day		
Measurement Presentation		
Manufacturing Presentation		
Atomic Struc. Presentation	ch 11	Quiz
Material Properties Presentation		
Metals Presentation	ch 12	
Polymers Presentation	ch 13	
Composite Presentation	ch 14	Quiz
Ceramic Presentation	ch 15	
Exam Review		
Exam 1		
GD&T/Rapid Prototyping pres	ch 17 & 18	
Milling pres	ch 20	
Lathe Pres	ch 21	
Drilling/Grinding/Sawing Presentation		Quiz
Nontraditional Machining Presentation		
Metal Forming Presentation	ch 22	
Sheet Metal Presentation	ch 23	
Powdered Metals Presentation	ch 24	
Casting Presentation	ch 25	
Finishing Presentation	ch 26	Quiz
No school		
Welding Presentation	ch 27	
Plastic/Composite/Ceramic Processes Pres	ch 28, 29, & 30	
CNC Presentation	ch 38	
Exam 2 Review		
Exam 2		
SPC Presentation	ch 42	
Quality Presentation	ch 43	
Fixture/Jig Presentation	ch 45	
Manufacturing Management	ch 46	
Welding Lab/Machining Lab		
Welding Lab/Machining Lab		
Welding Lab/Machining Lab		
Welding Lab/Machining Lab		
Welding Lab/Machining Lab		
Welding Lab/Machining Lab		
Production Systems Presentation	ch 47	
No school		
No school		
Lab day		
Last lab day		
Final Review		
Final 9:30 to 11:20		

Course Requirements

1. Complete assigned readings.
2. Attend all demonstrations.
3. Complete all assignments, both laboratory and homework.
4. Take all quizzes, Competency tests (4), and exams (3).
5. Follow safety practices and participate in all clean-up activities.

Evaluation

Because of the nature of this course attendance to every class is required to get a good grade.

Make sure you save copies of all your work and assignments.

The competency tests are a large part of your grade and must be passed to get a good grade.

Grades will be determined by dividing the total points received by the total points possible to find a percentage. A letter grade will be assigned using the following scale: 94-100=A, 90-93=A-, 87-89=B+, 83-86=B, 80-82=B-, 77-79=C+, 73-76=C, 70-72=C-, 67-69=D+, 63-66=D, below 63=F.

Required Texts

Rufe, P. (2002). *Fundamentals of manufacturing* (2nd ed.). Dearborn: Society of Manufacturing Engineers

Equipment

Required:

Safety Glasses

5/16 Square Tool Bit, HSS (Bookstore—in art supplies department)

Recommended:

Padlock for hall lockers for ETE students only (see secretary for locker assignment, room IS 112)

Work apron, shop coat, or coveralls.

Accommodation for Persons With Disabilities

In cooperation with the Disability Resource Center, reasonable accommodation will be provided for students with disabilities. Please meet with the instructor during the first week of class to make arrangements.