

**University Of California, Berkeley**  
**Department of Mechanical Engineering**

**ME 122: Processing of Materials in Manufacturing (3 units)**

**Elective Course**

*Syllabus*

**CATALOG DESCRIPTION**

Fundamentals of manufacturing processes (metal forming, forging, metal cutting, welding, joining, and casting); selection of metals, plastics and other materials relative to the design and choice of manufacturing processes.

**COURSE PREREQUISITES**

ME 108 and ME C85/CE C30.

**TEXTBOOK(S) AND/OR OTHER REQUIRED MATERIAL**

Required text: Manufacturing Processes for Engineering Materials, by S. Kalpakjian and S. R. Schmid, 4th Edition, Prentice Hall, 2003

**COURSE OBJECTIVES**

Understand a broad range of manufacturing processes. Be able to select a suitable process (or sequence of processes) for the manufacture of a given component. Be able to perform force and power calculations for manufacturing processes. Be able to suggest changes in component design for the improvement of manufacturability.

**DESIRED COURSE OUTCOMES**

Upon completion of the course the student should have:

The ability to identify, formulate, and solve engineering problems relating to manufacturing; the ability to apply mathematics, basic science, and engineering science to the solution of manufacturing problems; the ability to design a component and select a manufacturing process or sequence of processes suitable for its production; the ability to interpret the results of engineering investigations.

**TOPICS COVERED**

Mechanical properties of engineering materials; metal casting; forging; wire drawing; extrusion; rolling; sheet metal shearing; bending; deep drawing; manufacturing with

**TOPICS COVERED (Cont.)**

polymers and composites; powder metallurgy; material removal basics; tool wear and tool life; cutting tool materials; turning, milling, and drilling; grinding; non-traditional material removal processes; rapid prototyping; soldering; microelectronic component manufacturing.

## **CLASS/LABORATORY SCHEDULE**

Three hours of lecture and one hour of discussion per week.

## **CONTRIBUTION OF THE COURSE TO MEETING THE PROFESSIONAL COMPONENT**

This course contributes primarily to the students' knowledge and understanding of manufacturing processes.

## **RELATIONSHIP OF THE COURSE TO ABET PROGRAM OUTCOMES**

An ability to apply knowledge of mathematics, science, and engineering; an ability to design a system, component, or process to meet desired needs; an ability to identify, formulate, and solve engineering problems; a recognition of the need for, and an ability to engage in life-long learning; a knowledge of contemporary issues; an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## **ASSESSMENT OF STUDENT PROGRESS TOWARD COURSE OBJECTIVES**

- Homework assignments on a biweekly basis
- Hour exams
- Final exam

**PERSON(S) WHO PREPARED THIS DESCRIPTION:** Klaus J. Weinmann Feb. 26, 2006