

Course discipline/number/title: CAD 1147: Manufacturing Material and Processes II

A. CATALOG DESCRIPTION

1. Credits: 3
2. Hours/Week: 1 lecture, 4 lab
3. Prerequisites (Course discipline/number): CAD 1039, CAD 1120, CAD 1220, CAD 1221
4. MnTC Goals (if any): NA

This course is designed to provide detailed knowledge of materials and processes used in the manufacturing of products, machines, and structures. The course is designed in a lecture/lab format divided into units including casting and molding, forming, separating, conditioning and assembly techniques. Tours of the machining/drafting industry will be an integral part of this class. Upon completion of this course, students should have a working knowledge of common materials and manufacturing activities used to create products from designs. This knowledge will further enhance the students' ability to design products for manufacturing. Students must receive a grade of C or better in all prerequisite courses.

B. DATE LAST REVISED (Month, year): October, 2017

C. OUTLINE OF MAJOR CONTENT AREAS:

1. Introduction to Material Processing
  - a) Nature of Manufacturing
  - b) Industrial Material
2. Casting and Molding
  - a) Casting metals
  - b) Casting and molding plastics
  - c) Casting ceramic material
3. Machining (conventional)
  - a) Turning
  - b) Milling
  - c) Shearing/Punching
4. Machining (non-conventional)
  - a) Flame cutting
  - b) Laser
  - c) EDM
  - d) Waterjet
5. Composite Materials
6. Conditioning
7. Assembly
  - a) Welding
  - b) Adhesives
  - c) Fasteners
8. Finishing
  - a) Painting
  - b) Plating
  - c) Anodizing

D. LEARNING OUTCOMES (GENERAL): The student will be able to:

1. Develop the ability to match the proper manufacturing operations to a part.
2. Define manufacturing process terminology.
3. Demonstrate an understanding of common materials.
4. Explain common manufacturing processes.
5. Observe and understand manufacturing operations and their applications.
6. Demonstrate the ability to document manufacturing process observations.

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:

Methods may include but not limited to:

1. Tests
2. Quizzes
3. Presentations
4. Class Participation
5. Written reports

G. RCTC CORE OUTCOME(S) ADDRESSED:

Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.

H. SPECIAL INFORMATION (if any): None