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

A. CATALOG DESCRIPTION
1. Credits: 3 (2 credit lecture, 2 credit lab)
2. Hours/Week: 1 hour lecture, 4 hours lab
3. Prerequisites (Course discipline/number): None
4. Co-requisites (Course discipline/number): None
5. 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 laid out in a lecture/lab format broken 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 that are used to create products from their designs. This knowledge will further enhance the students’ ability to design manufacturable products.

B. DATE LAST REVISED (Month, year): April, 2013

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:
   1. Tests
   2. Quizzes
   3. Presentations
   4. Class Participation
   5. Written reports
   6. Due to the nature of the class, attendance will also be factored into the students’ grade.

G. RCTC CORE OUTCOME(S) ADDRESSED:
   - Communication
   - Critical Thinking
   - Global Awareness/Diversity
   - Civic Responsibility
   - Personal/Professional Accountability
   - Aesthetic Response

H. SPECIAL INFORMATION (if any):
   1. Safety glasses are required
   2. Tuition differential