COMMON COURSE OUTLINE: Course discipline/number/title: CAD 1145: Manufacturing Materials and Processes I

A. CATALOG DESCRIPTION
   1. Credits: 3 (1 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 will give the student a firm foundation in shop safety, blue print reading, the use and care of measuring instruments and various other hand tools used in the machining field. The student will also learn about the operation of vertical milling machines, engine lathes, cot-off saws, and other machine shop equipment. They will also be introduced to product assembly and fastening technology fundamentals. This will be taught with emphasis placed on the gaining hands-on experience.

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

C. OUTLINE OF MAJOR CONTENT AREAS:
   1. Safety in the Machine Shop
   2. Systems of Measurement
   3. Using and Reading Steel Rules
   4. Using Micrometers and Calipers
   5. Basic Art of Machining Metal
   6. Square a vise in a Milling Machine
   8. CNC Milling
   9. Manual Lathe
   10. CNC Lathe
   11. Calculating Speeds and Feeds
   12. Drilling and Tapping Operations
   13. Mechanical assembly techniques

D. LEARNING OUTCOMES (GENERAL): The student will be able to:
   1. Demonstrate how to work safely in the shop.
   2. Explain the proper use of many common shop tools.
   3. Use micrometers, calipers and measuring instruments with accuracy.
   4. Square a vise in the CNC and manual milling machines.
   5. Create tolerance parts using a vertical manual mill.
   6. Create a tolerance part on the CNC Mill.
   7. Create a tolerance part using the manual lathe.
   8. Create a tolerance part on the CNC lathe.
   9. Program a part using conversational mill programming.
   10. Use the correct speeds and feeds for cutting.
   11. Drill and Tap metal parts.
   12. Inspect parts then produce a report on the accuracy.

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:
   1. Evaluation of Class Projects
   2. Skill Proficiency
   3. Quizzes and Exams
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. Tuition differential
2. Safety Glasses required