



South Central College

## CMAE 1512 Introduction to Manufacturing

### Common Course Outline

#### Course Information

**Description** *Explore the exciting world of Manufacturing and begin your training for a great career! This course provides an overview of different fields within Manufacturing and the opportunity for students to learn basic skills in a variety of high-demand fields, including Carpentry, Machining, Mechatronics, and Welding. In addition to the hands-on activities that will be completed throughout the course, students will also have the opportunity to earn a Precision Measuring credential.*

**Total Credits** 2

**Total Hours** 64

#### Types of Instruction

Instruction Type	Credits/Hours
Lab	2/64

#### Pre/Corequisites

None

#### Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

#### Course Outcomes

##### 1. Identify Various Manufacturing Careers and Skill Sets

###### Learning Objectives

- Explore career options within Manufacturing
- Discuss educational options to pursue and complete educational training within Manufacturing
- Identify regional Manufacturing employers and job qualifications

##### 2. Explore Basic Machining Operations

###### Learning Objectives

- Identify Control System on CNC Mill

Explain Offsets for CNC axis.  
Describe Coordinate Systems Cartesian.

### **3. Explore Basic Welding Techniques and Safety**

#### **Learning Objectives**

Demonstrate safety specific to oxy-fuel welding procedures.  
Perform manual and machine cutting using various welding equipment.  
Prepare welding equipment to accomplish given tasks.  
Utilize knowledge of rod manipulation in SMAW.  
Demonstrate single pass and multiple pass welding techniques.  
Identify proper equipment for performing GMAW.  
Practice a variety of GMAW weldments.

### **4. Describe Mechatronics and Skills Related to Automated Manufacturing Systems**

#### **Learning Objectives**

Exhibit an ability to interpret mechanical prints.  
Explain Geometric Dimensioning and Tolerancing  
Interpret prints that use Geometric Dimensioning and Tolerancing.

### **5. Explore Basic Carpentry Techniques**

#### **Learning Objectives**

Interpret floor plans for a project.  
Utilize basic hand tools.  
Demonstrate tool care and handling.  
Demonstrate ability to operate stationary power tools.  
Identify organizational methods for construction drawings.  
Interpret drawing dimensions.

### **6. Demonstrate the Fundamentals of Working with Precision Measurement Instruments**

#### **Learning Objectives**

Demonstrate Tape and Rule Measurement  
Demonstrate Slide Caliper Measurement  
Demonstrate Gauge Measurement  
Demonstrate Angle Measurement  
Demonstrate Micrometer Measurement  
Demonstrate Dial Gauge Measurement

### **7. Identify personal protection equipment as it relates to manufacturing.**

#### **Learning Objectives**

Describe the two primary means of protecting employees from workplace hazards.  
Explain what should be accomplished in PPE training.  
List PPE that may be used to protect the eye, face, head, feet, hands, arms, bodies, and hearing.  
Identify hazards that are lessened or eliminated by using the appropriate PPE for eye protection, hearing protection, foot and hand protection, face protection, and body protection.

### **8. Explain the safety concerns of hand tools and machine guarding used in manufacturing.**

#### **Learning Objectives**

Explain the safety concerns of hands tools that maybe used in manufacturing.  
Describe the different types of guarding that machines may use.  
Explain the clearance of guards and when machine guards need to be adjusted as machine is in use.

### **SCC Accessibility Statement**

Disability Services provides accommodations and other supports to students with permanent and temporary disabilities that affect their SCC experience. Disabilities may include mental health (anxiety, depression, PTSD), ADHD, learning disabilities, chronic health conditions (migraine, fibromyalgia), sensory disabilities, and temporary disabilities (broken arm, surgery). Common accommodations are extended test time, private room for testing, audiobooks, and sign language interpreter.

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