

SYLLABUS  
PART I  
EDISON COMMUNITY COLLEGE  
MFG 234S CNC PROGRAMMING  
3 CREDIT HOURS

**COURSE DESCRIPTION**

Fundamentals of manual programming for numerical control machines. Topics include: CNC machine types, controls, safety, and coordinate measuring systems; speed and feed calculations; CNC tooling and fixturing; and programming CNC mills and lathes. Embedded CNC software is utilized for this course. Prerequisite: Grade of C or better in MFG 114S. Lab fee.

**COURSE GOALS**

The student will:

1. Explain and apply common formats and codes for manual programming.
2. Create a manual CNC program.
3. Explain and document setup procedures for CNC lathes and mills.
4. Troubleshoot a manual CNC program.
5. Perform set-up procedures on a CNC machine.
6. Make the part to print specifications.
7. Explain secondary manual programming techniques.
8. Explain and demonstrate height compensation, cutter compensation, and tooling offset.

**CORE VALUES**

The Core Values are a set of principles which guide in creating educational programs and environments at Edison. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

**TOPIC OUTLINE**

1. Types of CNC Machines
2. CNC Controls and Machine Components
3. CNC Machine Safety
4. Coordinate Systems for CNC Machines
5. Planning for Creation of a CNC Program
6. Speed and Feed Calculations
7. CNC Tooling and Fixturing
8. Mill Programming
  - a. Establishing Zero
  - b. Straight Line Moves
  - c. G and M Codes
  - d. Canned Cycles
  - e. Circular Interpolation
  - f. Offsets
9. Lathe Programming
  - a. Establishing Zero
  - b. Coordinate Systems, Feeds, and Speeds
  - c. Simple Turning
  - d. G and M Codes

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- e. Canned Cycles
- f. Threading
- g. Offsets