

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Manufacturing Engineering Technology Program
Revision Date: August 2024

I. CATALOG DESCRIPTION

Course Number: MFGT1429
Course Title: CNC for Automation
Prerequisite(s): MFGT1421, MFGT2680
Catalog Description: Basic programming of Computer Numerical Control machines. Manual programming and programming with Mastercam software (current version) are covered.
Credit Hours: 3
Class Hours: 30
Lab Hours: 45
Total Contact Hours: 75

II. COURSE OBJECTIVES: *Course will:*

- A. Introduce basic programming of Computer Numerical Control machines.
- B. Introduce basic Cam programming with Mastercam and DELMIA software.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Explain the history, terminology and capabilities of computer numerically controlled machines.
 - 2. Create manual programs using a series of practice programs.
 - 3. Demonstrate drawing projects with Mastercam software.
 - 4. Verify programming projects with Mastercam software.
- B. General Education Learning Outcomes
 - 1. GELO #5: Analytical, Quantitative, and Scientific Reasoning
Outcome 4: Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE (*course outline may provide more detailed information*)

- A. History, terminology, coding (EIA & ASCII), and G-Code Cycles
- B. Programming practice – manually programming the machine for different machining operations. These operations include: drilling, tapping, contour milling and pocketing.
- C. Basic and advanced CAD drawing using Mastercam software.
- D. Programming drill tool paths using Mastercam software.
- E. Programming contour milling tool paths using Mastercam software.
- F. Programming pocket milling tools paths using Mastercam software.
- G. Using Mastercam software to write the CNC G-Code for different machines.

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): None
- B. Other Resources:
 - 1. USB 2.0 flash card of equivalent storage (512 Mb minimum)
 - 2. Supplemental handouts supplied by instructor
 - 3. Safety glasses

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of presentation typically include a combination of the following:
 - 1. Lecture
 - 2. Small and large group discussion
 - 3. Video presentation
 - 4. Demonstrations
 - 5. Handouts
 - 6. Observations
 - 7. Assigned lab projects
 - 8. Field trips

VII. METHODS OF EVALUATION (*course outline will provide more detailed information*)

- A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 - 1. Notebook (if required)
 - 2. Quizzes
 - 3. Tests
 - 4. Lab grades

VIII. SPECIFIC COURSE REQUIREMENTS:

- A. Completion of all tests, projects, assignments, and notebook (if required).
- B. Must earn a final grade of 60% (1.0) or higher.
- C. Program shop safety rules will be followed. **Please see the course outline for any additional safety rules established by the instructor.**