**SOUTHEAST COMMUNITY COLLEGE**
**CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION**
**Precision Machining & Automation Technology Program**
**Revision Date: August 26, 2019**
Syllabus Statements

## I. CATALOG DESCRIPTION

| | |
|---|---|
| Course Number: | MACH2641 |
| Course Title: | Advanced CNC Theory |
| Prerequisite(s): | MACH1349, MACH1455 |
| Catalog Description: | Theory class covering advanced CNC process and procedure, and CNC support equipment. |
| Credit Hours: | 2.0 |
| Class Hours: | 23 |
| Lab Hours: | 23 |
| Total Contact Hours: | 46 |

## II. COURSE OBJECTIVES: *Course will:*

**A.** Demonstrate the operation, programming, and setup of the applicable CNC milling machines, CNC lathes, and additional support equipment such as a robotic cell.

**B.** Examine programming techniques and styles that are applicable to the equipment in the lab.

**C.** Introduce the students to various styles of programming that lean towards achieving efficiency in the part making process.

## III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

**A.** Student Learning Outcomes: *Student will be able to:*

**1.** Use proper syntax for required G-Code programming.

**2.** Wire a program and input or download the program to the CNC mills and lathes.

**3.** De-bug the program at the machine using the edit features of the CNC mill and lathes.

**4.** Setup and tool the CNC mills and lathes to produce assigned work pieces.

**B.** General Education Learning Outcomes (GELOs)

**1.** GELO 3: Critical Thinking & Problem Solving
Outcome 2: Synthesize information to arrive at reasoned solutions to problems.

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

**A.** Learn specific programming techniques for CNC Equipment

**1.** Programming set-up and running of Haas ST-10 Lathes

**2.** Programming and set-up of Haas VF Series VMC's

**3.** Operation and utilization of Renishaw onboard probing

**4.** Operation and utilization of a M10ia Robotic arm for use of load/unload manufacturing cell

**5.** Programming and operation of Okuma CNC lathe with Live tooling

**6.** Programming and operation of Okuma VMC with 32 station ATC

**7.** Operation of Zoller Presetter

## V. INSTRUCTIONAL MATERIALS

**A.** No textbook is required for the course. Instructor handouts and information posted on LMS are the main forms of static information.

## 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.** Demonstrations
**4.** Project boards
**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 evaluations, although determined by the individual instructor, traditionally includes a combination of the following:

**1.** Project grades
**2.** Participation/class conduct

## VIII. SPECIFIC COURSE REQUIREMENTS

**A.** Completion of all tests, projects, assignments, and notebook (if required).

**B.** Program shop safety rules will be followed. Please see the course outline for any additional safety rules established by the instructor.