SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Precision Machining & Automation Technology Program
Revision Date: August 24, 2020
Syllabus Statements

I. CATALOG DESCRIPTION

Course Number:	MACH2652
Course Title:	Advanced CNC and Automation Design
Prerequisite(s):	MACH1428 and MACH1455
Corequisite(s):	MACH2660 and MACH2641
Catalog Description:	In this class, a student will Concept, Design, Model, and create a full set of working blueprints for an automated equipment device of their choosing. Any pneumatic or electrical requirements of this device will also be fully documented and designed by the student. The student will also design a part to run on the fully automated robotic/VMC cell per class parameters. Both of these designed projects will be built and ran in the MACH2660 Lab portion of this focus.
Credit Hours:	3.0
Class Hours:	30
Lab Hours:	45
Total Contact Hours:	75

II. COURSE OBJECTIVES: *Course will:*

A. Demonstrate the proper operation, programming, and setup of the Fanuc/Haas Robotic load unload cell.

B. Prepare the student to be able to design/program/and execute a small production run on the Fanuc/Haas Robotic load unload cell. Part design is conceived by the student, per guidelines of the instructor.

C. Guide the student thru the design of a simple piece of automated equipment using Solidworks 3D Solid Modeling CAD System.

D. Prepare the student to create a detailed "Function Spec" to describe the operations of the automated device.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

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

1. Use proper syntax for required robot programming.

2. Successfully run a small production run with no errors.

3. Design and mate a functioning assembly in Solidworks 3D CAD System.

4. Create working blueprints for components and spec vendor required items.

B. General Education Learning Outcomes (GELOs)

1. GELO 6: Career and Life Skills
Outcome 4: Use digital technology effectively to access, manage, integrate, evaluate, and present information.

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

A. Design and program a robotic cell product, and design and specify automated equipment designs.

1. Create a project for the Robotic automation cell.

2. Program all necessary features and also, program all safeguards that will prevent a crash or undesired operation of the cell when it is left to run unattended.
3. Come up with a unique (but not necessarily original) concept for a piece of automated equipment.
4. Model all necessary components and create working assembly.
5. Create a functional spec which meticulously describes the operations of the device.
6. Produce detailed blueprints of the device.
7. Prepare all information for build in prescribed lab class.

V. INSTRUCTIONAL MATERIALS

A. No textbook is required for the course. Instructor handouts and information posted on the 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.