

EASTERN ARIZONA COLLEGE

Advanced Machine Shop III

Course Design
2014-2015

Course Information

Division Industrial Technology Education
Course Number MSP 270
Title Advanced Machine Shop III
Credits 3
Developed by Tad Dryden
Lecture/Lab Ratio 1 Lecture/4 Lab

Transfer Status

| ASU | NAU | UA |
|---------------------------|---------------------------|------------------|
| MET Departmental Elective | CTE Departmental Elective | Non Transferable |

Activity Course No
CIP Code 48.0500
Assessment Mode Portfolio
Semester Taught Spring
GE Category None
Separate Lab Yes
Awareness Course No
Intensive Writing Course No

Prerequisites

MSP 101 or MSP 104

Educational Value

Students will learn the final application processes for the industrial applications of the computer. Machine shop majors will learn skills that are in demand. Drafting students will see the further application of computers as drafted contours are machined by computer numerical control.

Description

A study of the methods of programming computerized numerical controlled machine tools, including continuous path contour planning, use of computer aided manufacturing, software, operating, editing programs and communicating with CNC machines. Using CNC machine tools to produce parts programmed from blueprint specifications.

Supplies

Safety Glasses
 Pocket Calculator

Competencies and Performance Standards

1. Operate all shop tools and equipment safely and effectively

Learning objectives

What you will learn as you master the competency:

- a. To identify the causes of accidents in a machine shop environment.
- b. To list the safety equipment required in shop operations.
- c. To list the safety rules for each machine tool and hand tool.
- d. To identify the conditions in a shop that could be considered hazardous.
- e. To identify the specific hazards of CNC operations.

Performance Standards

Competence will be demonstrated:

- o by completing assigned projects and by choosing correct tools for each task and using them correctly

Criteria - Performance will be satisfactory when:

- o learner practices recognized safety procedures and uses the prescribed safety equipment at all times
- o learner demonstrates an ability and willingness to follow designated procedures
- o learner uses graphics and safety envelope modes to prevent accidents and be aware of hazards in computer controlled equipment

2. Prepare and qualify all of the tools to be used in a CNC machining operation.

Learning objectives

What you will learn as you master the competency:

- a. To differentiate between center cutting and non-center cutting end mills.
- b. To describe the conditions that will call for carbide tooling.
- c. To describe the accuracy of holes produced by drilling, boring and reaming.
- d. To demonstrate the correct tool mounting procedures
- e. To demonstrate the correct setting of tool off-sets.

Performance Standards

Competence will demonstrated:

- o by using the tools and CNC machines in the machine shop

Criteria- Performance will be satisfactory when:

- o learner chooses appropriate cutting tools
- o learner mounts tools correctly
- o learner sets the tool off-sets correctly

3. Set up CNC lathes and mills with proper off-sets and program zero points.

Learning objectives

What you will learn as you master the competency:

- a. To follow the correct procedures for powering-up the CNC machines.
- b. To set the CNC reference zero.
- c. To set the program zero point.

- d. To establish tool change positions.
- e. To set the tool lathe reference.
- f. To demonstrate the correct tool change procedures.
- g. To demonstrate graphic and dry run operations.
- h. To demonstrate completion of a program cycle.
- i. To demonstrate shut-down procedures.

Performance Standards

Competence will be demonstrated:

- o by using the tools and CNC machines in the machine shop

Criteria - Performance will be satisfactory when:

- o learner uses CNC machine tools correctly

4. Demonstrate the proper use of repetitive cycles for drilling, facing, boring, hole-milling and threading.

Learning objectives

What you will learn as you master the competency:

- a. To define the term "canned cycle."
- b. To list the canned cycles available for each CNC machine
- c. To demonstrate the following commanded repetitive cycles: face milling, hole milling, deep hole drilling, peck drilling, boring and threading.

Performance Standards

Competence will be demonstrated:

- o by completing homework assignment
- o by using the CNC machines in the machine shop

Criteria - Performance will be satisfactory when:

- o learner correctly programs repetitive CNC cycles
- o learner correctly installs the CNC program and uses the repetitive cycles to produce the desired operations

Types of Instruction

Classroom Presentation

Lab

Grading Information

Grading Rationale

80% of final grade - project grades

10% of final grade - final exam

10% of final grade - attendance

Grading Scale

| | |
|---|------------|
| A | 90% - 100% |
| B | 80% - 89% |
| C | 70% - 79% |
| D | 60% - 69% |
| F | Below 60 % |