

EASTERN ARIZONA COLLEGE

Advanced Machine Shop II

Course Design
2014-2015

Course Information

Division Industrial Technology Education
Course Number MSP 250
Title Advanced Machine Shop II
Credits 3
Developed by Tad Dryden
Lecture/Lab Ratio 1 Lecture/4 Lab

Transfer Status

ASU	NAU	UA
Non Transferable	CTE Departmental Elective	Non Transferable

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

Prerequisites

MSP 240

Educational Value

This course will promote an understanding of modern industry and applied machine tool technology. Machine shop majors will further develop their skills in advanced machine shop and receive knowledge necessary for employment. Set up and demonstration of CNC skills and competencies will be shown

Description

This course promotes advanced skill development in the machine shop along with technical theory of machine tool operations. Projects consist of computer numerical control machining and complex machine tool processes.

Supplies

Safety Glasses
 All other supplies are furnished by the department

Competencies and Performance Standards

1. Demonstrate the use of all tools and machines in a safe and effective manner.

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 operation.
- 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.

Performance Standards

Competence will be demonstrated:

- o by completing the assigned projects
- o by choosing the 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

2. Calculate accurately all of the settings necessary for machine set-ups and product inspection.

Learning objectives

What you will learn as you master the competency:

- a. To demonstrate the use of the pocket calculator to do shop math.
- b. To use right triangle trigonometry to find angles and coordinate positions
- c. To calculate gage block build up for sine bar s
- d. To calculate speeds and feeds for all machine tools.
- e. To calculate measurements for ball drop, dove-tail surfaces, stock sizes, radius, cord height, machine tapers and measurements on a thread block.

Performance Standards

Competence will be demonstrated:

- o by completing homework assignments
- o in completing classroom exercises
- o in setting up the machine tools in the machine shop
- o in using the inspection equipment in the shop

Criteria - Performance will be satisfactory when:

- o learner demonstrates an ability to make the required calculations and record the correct answers to shop problems.

3. 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

4. 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

5. 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:

- learner correctly programs repetitive CNC cycles
- 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 %