Western Technical College

10444216 Machine Setup 2 for CNC Turning (CBE)

Course Outcome Summary

Course Information

Description	Requires the learner to set up CNC Turning machines for projects that require the application of multiple tools with electronic probing through tool selection and setup, work holding devices and program call up and proofing. Students should complete Machine Setup 1 for CNC Turning prior to starting this course.
Career Cluster	Manufacturing
Instructional Level	One-Year Technical Diploma
Total Credits	1
Total Hours	36

Textbooks

No textbook required.

Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** Campus Shop. Required.

Proper footwear - $35.00-75.00. **Vendor:** To be discussed in class. Required.

Scientific calculator (recommend T1-36x Solar). **Vendor:** Campus Shop. Required.

Three-ring binder. **Vendor:** Campus Shop. Required.

Clipboard. **Vendor:** Campus Shop. Required.

Pens/Pencils/Black Sharpie Marker. **Vendor:** Campus Shop. Required.

Minimum 4GB USB Flash Drive. **Vendor:** Campus Shop. Required.

Success Abilities

1. Cultivate Passion: Increase Self-Awareness
2. Refine Professionalism: Improve Critical Thinking
3. Refine Professionalism: Practice Effective Communication

Program Outcomes

1. Apply basic safety practices in the machine shop.
2. Interpret industrial/engineering drawings.
3. Apply precision measuring methods to part inspection.
4. Perform programming, set-up and operation of CNC Machine Tools.

Course Competencies

1. Perform machine start up with CNC turning controls.

Assessment Strategies

1.1. Written Product
1.2. Skill demonstration in the shop on CNC machine tools

Criteria

You will know you are successful when

1.1. you follow safety procedures when starting up machines.
1.2. you sequentially and accurately lists the steps required to start and home CNC turning centers.
1.3. you correctly demonstrate the ability to start and home all CNC turning machines in the machine tool lab.
1.4. you follow documented procedures for the CNC turning center.

Learning Objectives

1.a. Observe safe operating procedures for machine start up
1.b. Locate and identify the main machine controls on CNC milling machines
1.c. Describe the process for starting and homing CNC milling machines
1.d. Demonstrate the process and procedures for starting and homing CNC milling machines
1.e. Perform CNC machining center warm up

2. Select cutting tools for CNC turning processes.

Assessment Strategies

2.1. Written product
2.2. Skill Demonstration

Learning Objectives

2.a. Describe the characteristics of carbide inserts
2.b. Explain the factors to consider when selecting carbide grades
2.c. Explain the factors to consider when selecting carbide insert radii
2.d. Describe the effect of carbide insert shape selection on machining considerations
2.e. Select carbide cutting tools for CNC milling applications
2.f. Describe how to use and care for carbide tooling

3. Determine workholding needs for CNC machining.

Assessment Strategies

3.1. Written product
3.2. Skill Demonstration

Learning Objectives

3.a. Describe types of workholding for CNC machines.
3.b. Determine workholding support and location methods.
3.c. Determine workholding and clamping methods.
3.d. Discuss the location of the workholding device relative to the machine size
3.e. Describe precision grid plates as an alternative to dedicated fixtures
3.f. Explain considerations related to preventing collisions during tool changes
3.g. Explain the use of stops and locating blanks with regard to precision
3.h. Explain problems that can occur from excessive clamping forces

4. Set up CNC turning machines for programs that require a minimum of three tools.

Assessment Strategies

4.1. Written product
4.2. Skill Demonstration

Criteria

You will know you are successful when

4.1. you complete a setup plan for a program with a minimum of three different tools.
4.2. you setup and run a program with a minimum of three different tools.

Learning Objectives

4.a. Demonstrate program management.
4.b. Identify tools used for location.
4.c. Perform tool setting procedures.
4.d. Set part origin.
4.e. Practice multiple tool applications with electronic probing.
4.f. Verify program using graphics.