Western Technical College

31420349 Precision Machining Capstone

Course Outcome Summary

Course Information

Description	This course requires students to further practice and refine the skills learned in all previous courses involving manual and CNC machining through additional projects.
Career Cluster	Manufacturing
Instructional Level	One-Year Technical Diploma
Total Credits	4
Total Hours	144

Textbooks

Mastercam X8 Training Guide – Mill 2D. Copyright 2014. Manton, Matthew and Duane Weidinger. Publisher: Cominstructor.com. **ISBN-13:** 978-1-927359-48-8. Required.

Mastercam X8 Training Guide – Lathe. Copyright 2014. Manton, Matthew. Publisher: Cominstructor.com. **ISBN-13:** 978-1-927359-58-7. Required.

420-310 CNC Programming Manual Machine Tool Technology. Western. Publisher: Western. 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.

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 basic machine tool equipment set-up and operation.
5. Perform programming, set-up and operation of CNC Machine Tools.

Course Competencies

1. Apply basic safety practices in the machine shop.

Learning Objectives

1.a. Demonstrate safety procedures
1.b. Operate machine with all required guards in place
1.c. Maintain clean and organized work environment
1.d. Wear appropriate clothing and Personal Protective Equipment (PPE)
1.e. Explain proper lock-out tag-out procedures

2. Interpret industrial/engineering drawings.

Learning Objectives

2.a. Interpret orthographic projections
2.b. Interpret lines, symbols, standards, and notations
2.c. Interpret a Bill of Materials
2.d. Interpret a title block
2.e. Determine location of part features according to established specifications
2.f. Calculate tolerances according to established specifications
2.g. Develop drawings that follow view projection standards
2.h. Interpret Geometric Dimensioning and Tolerancing

3. Apply precision measuring methods to part inspection.

Learning Objectives

3.a. Select correct measuring tool for job requirements
3.b. Demonstrate care of precision measuring equipment according to established procedures
3.c. Convert English/metric measurements
3.d. Use standard industry measurement terminology
3.e. Perform precision measurement according to established procedures
3.f. Complete an inspection document to verify print specifications
3.g. Use computer aided metrology

4. Perform basic machine tool equipment set-up and operation.

Learning Objectives

4.a. Select and load tools according to the requirements of the job
4.b. Select and set up work-holding devices for specific operations
4.c. Verify machine set-up
4.d. Verify proper application of speeds and feeds
4.e. Operate machine tools according to established procedures
4.f. Complete project within specified timeframe
4.g. Take action to optimize machine tool operation

5. Perform operation of CNC Machine Tools.

Learning Objectives

5.a. Execute program
5.b. Adjust speeds and feeds to optimize CNC machining conditions

6. Perform set-up of CNC Machine Tools.

Learning Objectives

6.a. Load the correct program into the machine
6.b. Verify the CNC program in graphics.
6.c. Verify work and tool offsets
6.d. Execute program
6.e. Adjust speeds and feeds to optimize CNC machining conditions
6.f. Adjust tool off-sets to make parts within specifications.

7. Perform programming of CNC Machine Tools.

Learning Objectives

7.a. Write basic programs for specified CNC machine tools according to EIA-ISO standards

7.b. Load the correct program into the machine