



Course Number and Title: MET 105 Machine Shop Practicum I

Campus Location:

Stanton

Effective Date:

2018-51

Prerequisite:

MET 123, EDD 131 or concurrent

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

2.00 lecture hours/week

5.00 lab hours/week

Course Description:

In this course, students refine skills learned in other classes and develop basic skills required in modern machine shops. Emphasis is on safety for both the operator and the machine as well as other workers.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

None

Schedule Type:

Classroom Course

Disclaimer:

None

Core Course Performance Objectives (CCPOs):

1. Perform safety inspections related to the machine shop environment. (CCC 1, 3; PGC 2)
2. Review and correct drawings applied to machine shop projects. (CCC 1, 2, 3; PGC 1)
3. Apply various methods to design, draw, and build a fixture. (CCC 1, 2, 3, 6; PGC 1, 2, 3)
4. Operate the engine lathe to perform advanced operations. (CCC 2, 6; PGC 1, 2, 3)
5. Select, weld (if needed), and install sawing blades. (CCC 1, 2; PGC 1, 2)
6. Identify, install, and use rotary tables and indexing heads. (CCC 1, 2; PGC 1, 2)
7. Design and manufacture parts using computerized numeric control equipment. (CCC 1, 2, 3; PGC 1, 2, 3)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Perform safety inspections related to the machine shop environment.
 1. Inspect the work area for unsafe conditions, including chemical and material storage and machine safeguarding.
 2. Complete a finding report based on an inspection.
 3. Research and produce recommendations using Occupational Safety and Health Administration (OSHA) standards.
2. Review and correct drawings applied to machine shop projects.
 1. Evaluate current shop project drawings for accuracy and completeness.
 2. Make written recommendations for changes to current drawings
 3. Create new computer-aided design (CAD) drawings incorporating all necessary changes.
3. Apply various methods to design, draw, and build a fixture.
 1. Design fixtures to be used for machining and inspection of shop projects.
 2. Using a CAD system, create necessary drawings for the new project.
 3. Using the shop equipment, manufacture the newly designed fixture.
 4. Re-evaluate the manufacturing project, and make recommendations for drawing/process changes.
4. Operate the engine lathe to perform advanced operations.
 1. Perform taper turning by using the following methods: offsetting the tail stock, using the taper attachment, and setting the compound rest.
 2. Identify and set up a chucker lathe to produce a sample project.
 3. Use a tracer attachment on a lathe.
 4. Machine 60-degree and acme threads on a lathe.
 5. Satisfactorily knurl selected materials using several knurling tools.
 6. Machine with a lathe using a mandrel.
 7. Adjust and perform normal maintenance on lathes.
5. Select, weld (if needed), and install sawing blades.
 1. Select appropriate material used for saw blades.
 2. Perform welding operations on several types of bandsaw materials.
 3. Safely use the bandsaw and cut off saws to cut selected materials.
 4. Demonstrate maintenance and normal upkeep of common sawing machines.
6. Identify, install, and use rotary tables and indexing heads.
 1. Explain the differences between a rotary table and an indexing head.
 2. Set up and use a rotary table to machine a sample part.
 3. Install and align an indexing head for vertical and horizontal usage.
7. Design and manufacture parts using computerized numeric control equipment.
 1. Write a computer numerical control (CNC) program for sample projects on the Haas vertical machining center that includes tool selection and installation, drilling, tool offsets, multiple parts, speeds and feeds, reaming, and contouring.
 2. Produce a program using the CNC lathe.
 3. Save programs to disk and on individual CNC machines.

Evaluation Criteria/Policies:

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Identify effective problem-solving skills for making appropriate decisions relative to the machinist profession.
2. Demonstrate basic computer applications knowledge and 3D parametric modeling software skill.
3. Use basic machining, welding operations and perform basic programming of computer numerically controlled machines.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.