

Clackamas Community College
Online Course/Outline Submission System

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Section #1 General Course Information**Department:** Manufacturing**Submitter**

First Name: Mike
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Course Prefix and Number: MFG - 103**# Credits:** 3**Contact hours**

Lecture (# of hours):
Lec/lab (# of hours): 66
Lab (# of hours):
Total course hours: 66

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

Course Title: Machining for the Fabrication and Maintenance Trades**Course Description:**

This course is an introduction to metal working for welders, fabricators, maintenance personnel and others who need to understand simple machining principles. Students will be introduced to precision measurement with calipers and micrometers. Combination squares, protractors dividers and scribe will used for semi-precision layout of workpieces in preparation for machining. The elementary use of the drill press, band saw, milling machine and lathe, as well as hand tools, will be practiced during hands-on labs. A discussion of thread systems will include nomenclature, measurement, tapping, chasing and repair.

Type of Course: Career Technical Preparatory**Reason for the new course:**

Better fit for non-machining students

Is this class challengeable?

Yes

Can this course be repeated for credit in a degree?

No

Is general education certification being sought at this time?

No

Does this course map to any general education outcome(s)?

No

Is this course part of an AAS or related certificate of completion?

Yes

Name of degree(s) and/or certificate(s): Welding Technology AAS

Are there prerequisites to this course?

No

Are there corequisites to this course?

No

Are there any requirements or recommendations for students taken this course?

Yes

Recommendations: MTH-050

Requirements: None

Are there similar courses existing in other programs or disciplines at CCC?

No

Will this class use library resources?

Yes

Have you talked with a librarian regarding that impact?

No

Is there any other potential impact on another department?

No

Does this course belong on the Related Instruction list?

No

GRADING METHOD:

A-F or Pass/No Pass

Audit: Yes

When do you plan to offer this course?

✓ Not every term

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

No

Will this course appear in the college catalog?

Yes

Will this course appear in the schedule?

Yes**Student Learning Outcomes:**

Upon successful completion of this course, students should be able to:

1. use precision measuring tools to measure to a tolerances of $\pm.001$,
2. perform measurements with a ruler to an accuracy of 1/64 of an inch,
3. perform semi-precision layout of bolt hole circles and patterns, square and angular features with the use of a combination square, scribe, protractor and dividers;
4. determine the limitations of machining operations and identify situations when professional, precision machining is required;
5. safely setup and operate a drill press, vertical and horizontal bandsaw;
6. calculate cutting speeds for high speed steel tooling,
7. properly identify and apply cutting tools for hole-making, turning and milling operations;
8. perform elementary machining operations on a milling machine and lathe including creating keyways, turning, facing and grooving operations;
9. create working sketches of common machine elements to include relevant dimensions,
10. measure and identify screw threads,
11. drill and tap internal threads with the proper cutting tools,
12. chase external threads using threading dies,
13. repair stripped internal threads using threaded inserts.

This course does not include assessable General Education outcomes.

Major Topic Outline:

1. Safety.
2. Measurement.
 - a. Fractional measurement to 1/32 of an inch.
 - b. Dial/Digital calipers.

- c. Reading an outside micrometer.
- 3. Layout, semi-precision.
 - a. Square and inclined features.
 - b. Working from center lines.
 - c. Bolt-hole patterns.
- 4. Power Tools.
 - a. Drill motors.
 - b. Table saw.
- 5. Machine Tools.
 - a. Horizontal band saw.
 - b. Vertical band saw.
 - c. Drill press.
 - d. Vertical milling machine.
 - e. Engine lathe.
- 6. Hole-making.
 - a. Drills and drilling.
 - b. Sharpening a twist drill.
 - c. Counter sinks and bores, reamers, taper reamer.
- 7. Speed and feed calculations.
- 8. Threads.
 - a. Systems and nomenclature.
 - b. Measurement.
 - c. Tapping and chasing.
 - d. Repair.

Does the content of this class relate to job skills in any of the following areas:

- | | |
|--------------------------------------|------------|
| 1. Increased energy efficiency | Yes |
| 2. Produce renewable energy | No |
| 3. Prevent environmental degradation | Yes |
| 4. Clean up natural environment | No |
| 5. Supports green services | Yes |

Percent of course: 25%

First term to be offered:

Specify term: 2015 Spring
