



## **MACH 110 - Machine Technology 1 Course Outline**

**Approval Date:** 05/08/2007

**Effective Date:** 01/16/2018

### **SECTION A**

**Unique ID Number** CCC000326025

**Discipline(s)** Machine Tool Technology

**Division** Career Education and Workforce Development

**Subject Area** Machine Tool Technology

**Subject Code** MACH

**Course Number** 110

**Course Title** Machine Technology 1

**TOP Code/SAM Code** 0956.30 - Machine Tool Technology/Machinist\* / C - Occupational

**Rationale for adding this course to the curriculum** Last course update 2007

**Units** 7

**Cross List** N/A

**Typical Course Weeks** 18

**Total Instructional Hours**

#### **Contact Hours**

**Lecture** 54.00

**Lab** 216.00

**Activity** 0.00

**Work Experience** 0.00

**Outside of Class Hours** 108.00

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**Total Contact Hours** 270

**Total Student Hours** 378

**Open Entry/Open Exit** No

**Maximum Enrollment**

**Grading Option** Letter Grade or P/NP

**Distance Education Mode of Instruction**

## SECTION B

### General Education Information:

## SECTION C

### Course Description

**Repeatability** May be repeated 0 times

**Catalog** This is a beginning course in the machine tool technology degree program.

**Description** This course develops skills in the use of precision measuring instruments and the operation of the engine lathe, drill press, vertical milling machine, horizontal milling machine, and surface grinder.

### Schedule Description

## SECTION D

### Condition on Enrollment

1a. **Prerequisite(s):** *None*

1b. **Corequisite(s):** *None*

1c. **Recommended:** *None*

1d. **Limitation on Enrollment:** *None*

## SECTION E

### Course Outline Information

#### 1. Student Learning Outcomes:

- A. Work safely and accurately in a manufacturing environment.
- B. Perform basic calculations related to machining operations.
- C. Measure machined parts with precision measurement instruments.
- D. Complete basic machining operations on the engine lathe, milling machine, drill press, and grinder.
- E. Use hand tools to complete lab assignments.
- F. Heat-treat steel to a given hardness.

#### 2. Course Objectives: Upon completion of this course, the student will be able to:

- A. Accurately use scale and precision measurement instruments.
- B. Interpret a drawing or sketch and devise a manufacturing process.
- C. Select from different tools and tooling for manufacturing a part.
- D. Use safe work practices with various machine tools.
- E.

#### 3. Course Content

- A. Safety in a manufacturing environment
- B. Semi-precision instruments
- C. Precision instruments
- D. Layout tools and procedures
- E. Hand tools
- F. Engine lathe operations
- G. Vertical milling machine operations
- H. Horizontal milling machine operations
- I. Surface grinders
- J. Drilling machines
- K. Heat-treatment of steels
- L.

#### 4. Methods of Instruction:

**Lab:** 1. Instructor demonstrates various hands-on techniques of machine tool operations. 2. With Instructor supervision students demonstrate assimilation and proficiency of various hands-on techniques of machine tool operations.

**Lecture:** Instructor lectures on various topics related to Machine Tool Technology, e.g.,: Shop safety, Measurement, Shop math, Tool geometry, Engine lathe operations Milling machine operations Heat-treating steel

**Projects:** Hand tool project, Tool grinding, Various projects demonstrating proficiency in engine lathe turning, facing, drilling, threading, boring, grooving, knurling. Various projects demonstrating proficiency in milling machine operations such as tool selection, milling, indexing, drilling, tapping, spot-facing, fly-cutting, keyway-cutting.

**5. Methods of Evaluation:** Describe the general types of evaluations for this course and provide at least two, specific examples.

#### **Typical classroom assessment techniques**

Quizzes -- Students are given written weekly quizzes covering assigned reading and weekly lectures (example: quizzes consisting of identification and multiple choice questions).

Projects -- Student projects are evaluated by adherence to design characteristics and dimensional tolerances outlined in various machining assignments. Students tend to receive immediate feedback on project performance based on measurement of machined parts at the time of manufacture.

Lab Activities -- Student lab activities are project-based and are evaluated by adherence to design characteristics and dimensional tolerances outlined in various machining assignments. Lab activities are also evaluated by student's approaches to problem solving.

Final Exam -- Students are given a written final exam consisting of multiple choice and identification questions.

Mid Term -- Students are given a written midterm exam consisting of multiple choice and identification questions.

Letter Grade or P/NP

**6. Assignments:** State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

#### **A. Reading Assignments**

1. Students will be required to read their notes from lab lectures in order to perform their lab assignments (example: section on lathes operations and controls, "Machine Tool Practices", Kibbe, et al. textbook).

2. Students will be required to read weekly assignments from the textbooks in preparation for lectures and for lab assignments (example: lab assignment #1, machining of a chucking center).

#### **B. Writing Assignments**

1. Students will be required to read the assigned portions of the textbook to determine the correct procedure for machining a part (example: section on lathes operations and controls, "Machine Tool Practices", Kibbe, et al. textbook).

2. Students will be required to take notes on the procedures for completion of lab assignments (example: notes on the steps for machining a taper).

3. Students will analyze the drawings given to them and formulate a strategy for machining the assigned part (example: lab assignment #1, machining of a chucking center).

#### **C. Other Assignments**

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### **7. Required Materials**

**A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.**

Book #1:

Author: Kibbe, Neely, Meyer, & White

Title: Machine Tool Practice

Publisher: Prentice-Hall

Date of Publication: 2015

Edition: 10th

Book #2:

Author: Erik Oberg, Franklin D. Jones

Title: Machinery's Handbook

Publisher: Industrial Press

Date of Publication: 2016

Edition: 30th

**B. Other required materials/supplies.**