



MACH 111 - Machine Technology 2 Course Outline

Approval Date: 05/08/2007

Effective Date: 01/16/2018

SECTION A

Unique ID Number CCC000310127

Discipline(s) Machine Tool Technology

Division Career Education and Workforce Development

Subject Area Machine Tool Technology

Subject Code MACH

Course Number 111

Course Title Machine Technology 2

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

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 An intermediate course in the Machine Tool Technology degree program.

Description Emphasis is placed on accuracy and efficiency of producing machined parts on conventional machine tools. Advanced lathe operations, including various thread forms, are a focus of the course.

Schedule An intermediate course in the Machine Tool Technology degree program.

Description Emphasis is placed on accuracy and efficiency of producing machined parts on conventional machine tools.

SECTION D

Condition on Enrollment

1a. Prerequisite(s)

- MACH 110

1b. Corequisite(s): *None*

1c. Recommended: *None*

1d. Limitation on Enrollment: *None*

SECTION E

Course Outline Information

1. Student Learning Outcomes:

- Work safely and accurately in a manufacturing environment.
- Perform calculations related to accurately machining screw threads.
- Measure machined parts with precision measurement instruments.
- Complete advanced operations on machine tools.
- Machine unified, ISO metric, acme, 10-degree modified square threads, internal threads, tapers, and thread gauges.
- Select the proper steel for an application.

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

- Accurately use precision measurement instruments.
- Interpret a drawing or sketch and independently devise a manufacturing process.
- Independently select from different tools and tooling for manufacturing parts.
- Use safe work practices with various machine tools.
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3. Course Content

- Safety in a manufacturing environment
 - Housekeeping/slip-trip-fall mitigation
 - Safe machine tool operations
 - Fire safety/evacuation procedures
 - Safe lifting techniques
 - First aid procedures
- Dimensional measurement
 - Scale (fractional) measurement
 - Precision measurement
- Mechanical hardware
 - Fasteners

- b. Pins
- c. Retaining rings
- d. Keys
- D. Materials
 - a. Identification of materials
 - b. Metallurgy
 - c. Steel selection
 - d. Non-ferrous metal characteristics and selection
- E. Physics of metal cutting
 - a. Cutting tool geometry
 - b. High-speed steel tooling
 - c. Tungsten carbide tooling
- F. Thread forms and thread cutting
 - a. Unified thread characteristics
 - b. Metric thread characteristics
 - c. Acme thread characteristics and tooling
 - d. Modified square thread characteristics and tooling
- G. Cutting and measurement of tapers
 - a. Using compound rest
 - b. Using taper attachment
 - c. Converting taper-per-foot to angles in degrees
 - d. Techniques for measuring tapers
- H. Machining precision thread gauges
 - a. Using taps and dies
 - b. Single-point cutting tool method
 - c.

4. Methods of Instruction:

Lab:

Lecture:

Projects:

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 --

Final Exam --

Mid Term --

Additional assessment information:

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

Students will be given a written midterm exam and a written final exam. (example: a midterm and a final exam consisting of multiple choice and identification questions).

Students will complete weekly lab assignments. (example: lab assignment #1, machining of a 1"-8 UNC thread).

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: lecture on the sections on threads, 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: section on Mechanical Hardware, ?Machine Tool Practices?, Kibbe, et al. textbook).

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: sections on screw threads, ?Machine Tool Practices?, Kibbe, et al. textbook).

2. Students will be required to take notes on the procedures for completion of lab assignments (example: lecture on the sections on tapers, ?Machine Tool Practices?, Kibbe, et al. textbook).

3. Students will analyze the drawings given to them and formulate a strategy for machining the assigned part (example: drawing for machining a tapered pipe thread).

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: Oberg, Jones, Horton & Ryffel

Title: Machinery's Handbook

Publisher: Industrial Press

Date of Publication: 2016

Edition: 30th

B. Other required materials/supplies.