

# MACH-111: MACHINE TECHNOLOGY 2

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## Effective Term

Fall 2026

## CC Approval

10/03/2025

## AS Approval

10/09/2025

## BOT Approval

10/16/2025

## SECTION A - Course Data Elements

### Send Workflow to Initiator

No

### CB04 Credit Status

Credit - Degree Applicable

### Discipline

Minimum Qualifications	And/Or
Machine Tool Technology (Tool and die making) (Any Degree and Professional Experience)	

### Subject Code

MACH - Machine Tool Technology

### Course Number

111

### Department

Machine Tool Technology

### Division

Career Education and Workforce Development (CEWD)

### Full Course Title

Machine Technology 2

### Short Title

Machine Technology 2

### CB03 TOP Code

0956.30 - \*Machining and Machine Tools

### CB08 Basic Skills Status

NBS - Not Basic Skills

### CB09 SAM Code

C - Clearly Occupational

### Rationale

The SLOs were revised to streamline outcomes, eliminate redundancy, and ensure alignment with current industry standards and measurable skills for student success.

## SECTION B - Course Description

### Catalog Course Description

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

## SECTION C - Conditions on Enrollment

### Open Entry/Open Exit

No

### Repeatability

Not Repeatable

### Grading Options

Letter Grade or Pass/No Pass

### Allow Audit

Yes

## Requisites

### Prerequisite(s)

Completion of MACH-110 with a minimum grade of C.

## Requisite Justification

### Requisite Description

Course in a Sequence

### Subject

MACH

### Course #

110

### Level of Scrutiny

Content Review

### Upon entering this course, students should be able to:

A student will be able to:

Work safely in a machining environment.

Measure machined parts accurately using precision measuring tools.

Perform basic operations safely on a lathe, milling machine, drill press, and surface grinder.

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## SECTION D - Course Standards

### Is this course variable unit?

No

### Units

7.00

### Lecture Hours

54.00

### Lab Hours

216.00

### Outside of Class Hours

108

### Total Contact Hours

270

### Total Student Hours

378

## Distance Education Approval

Is this course offered through Distance Education?

No

## SECTION E - Course Content

### Student Learning Outcomes

Upon satisfactory completion of the course, students will be able to:	
1.	Perform intermediate machining operations, including unified, metric, acme, and modified square threading, as well as internal threads and tapers, on conventional machine tools.
2.	Apply thread-cutting formulas, taper conversions, and cutting tool geometry calculations to accurately machine parts to specification
3.	Use precision measuring tools to inspect thread pitch, taper dimensions, and surface quality, verifying that parts meet blueprint tolerances.
4.	Select appropriate materials and tooling based on part requirements, material properties, and machining processes.

### Course Objectives

Upon satisfactory completion of the course, students will be able to:	
1.	Accurately use precision measurement instruments.
2.	Interpret a drawing or sketch and independently devise a manufacturing process.
3.	Independently select from different tools and tooling for manufacturing parts.
4.	Use safe work practices with various machine tools.

### Course Content

1. Safety in a manufacturing environment
  - a. Housekeeping/slip-trip-fall mitigation
  - b. Safe machine tool operations
  - c. Fire safety/evacuation procedures
  - d. Safe lifting techniques
  - e. First aid procedures
2. Dimensional measurement
  - a. Scale (fractional) measurement
  - b. Precision measurement
3. Mechanical hardware
  - a. Fasteners
  - b. Pins
  - c. Retaining rings
  - d. Keys
4. Materials
  - a. Identification of materials
  - b. Metallurgy
  - c. Steel selection
  - d. Non-ferrous metal characteristics and selection
5. Physics of metal cutting
  - a. Cutting tool geometry
  - b. High-speed steel tooling
  - c. Tungsten carbide tooling
6. 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
7. 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
8. Machining precision thread gauges
- a. Using taps and dies
  - b. Single point cutting tool method

## Methods of Instruction

### Methods of Instruction

Types	Examples of learning activities
Lab	Instructor demonstrates various hands-on techniques of machine tool operations.  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, and heat-treating steel.
Activity	Students complete weekly machining projects (e.g., cutting a 1"-8 UNC thread, internal threading, taper machining) that reinforce lecture concepts.

## Methods of Evaluation

### Methods of Evaluation

Types	Examples of classroom assessments
Quizzes	Students are given written weekly quizzes covering assigned reading and weekly lectures (example: quizzes consisting of identification and multiple-choice questions).
Projects	Students demonstrate competency in intermediate machine operations (e.g., cutting tapers or threading) while being observed by the instructor.
Exams/Tests	Final Exam -- Students are given a written final exam consisting of multiple choice and identification questions.  Midterm -- Students are given a written midterm exam consisting of multiple choice and identification questions.

## Assignments

### Reading Assignments

- 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.
- 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).

### Writing Assignments

- 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.
- 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.
- 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.

## SECTION F - Textbooks and Instructional Materials

### Material Type

Textbook

### Author

Kibbe, Neely, Meyer, & White

**Title**

Machine Tool Practice

**Edition/Version**

11th

**Publisher**

Prentice-Hall

**Year**

2019

**Rationale**

Updated edition

**ISBN #**

9780134893501

**Material Type**

Textbook

**Author**

Oberg, Jones, Horton &amp; Ryffel

**Title**

Machinery's Handbook

**Edition/Version**

30th

**Publisher**

Industrial Press

**Year**

2020

**SECTION G - Diversity, Equity and Inclusivity****How does your course and/or course outline of record reflect strategies for accommodating and engaging diverse student populations, advancing equitable outcomes, and fostering inclusion for all students?**

This course fosters inclusion by offering differentiated assignments, collaborative projects, and real-world examples that resonate with diverse student backgrounds. Students are encouraged to problem-solve together, creating an environment where peer mentorship and teamwork enhance learning and equitable outcomes.

**Course Codes (Admin Only)****CB00 State ID**

CCC000310127

**CB10 Cooperative Work Experience Status**

N - Is Not Part of a Cooperative Work Experience Education Program

**CB11 Course Classification Status**

Y - Credit Course

**CB13 Special Class Status**

N - The Course is Not an Approved Special Class

**CB23 Funding Agency Category**

Y - Not Applicable (Funding Not Used)

**CB24 Program Course Status**

Program Applicable

**Allow Pass/No Pass**

Yes

**Only Pass/No Pass**

No