MACH-110: MACHINE TECHNOLOGY 1

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
110

Department
Machine Tool Technology

Division
Career Education and Workforce Development (CEWD)

Full Course Title
Machine Technology 1

Short Title
Machine Technology 1

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

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

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.	Apply safe work practices while operating hand tools and machine tools in a manufacturing environment.
2.	Perform foundational machining operations on the engine lathe, milling machine, drill press, surface grinder, and horizontal mill.
3.	Use precision measuring tools and perform basic shop math to inspect machined parts and verify tolerances.
4.	Interpret technical drawings to plan and execute basic machining processes, including layout, setup, and heat-treatment operations.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1.	Accurately use scale and precision measurement instruments.
2.	Interpret a drawing or sketch and devise a manufacturing process.

3.	Select from different tools and tooling for manufacturing a part.
4.	Use safe work practices with various machine tools.

Course Content

1. Safety in a manufacturing environment
2. Semi-precision instruments
3. Precision instruments
4. Layout tools and procedures
5. Hand tools
6. Engine lathe operations
7. Vertical milling machine operations
8. Horizontal milling machine operations
9. Surface grinders
10. Drilling machines
11. Heat-treatment of steels

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.
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.

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	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.
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

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.

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.

SECTION F - Textbooks and Instructional Materials

Material Type
Textbook

Author
Erik Oberg, Franklin D. Jones

Title
Machinery's Handbook

Edition/Version
30th

Publisher
Industrial Press

Year
2020

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

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 uses scaffolded instruction and individualized feedback to accommodate students with varying levels of prior experience. Lessons integrate visual, auditory, and kinesthetic approaches, ensuring all learners can engage effectively. Equity is advanced through structured lab time, ensuring every student has equal access to machines, tools, and instructor support.

Course Codes (Admin Only)

CB00 State ID

CCC000326025

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