MACH101 : Machine Technology I

General Information

Author:	• Jorge Palma
Course Code (CB01) :	MACH101
Course Title (CB02) :	Machine Technology I
Department:	MACH
Proposal Start:	Fall 2024
TOP Code (CB03) :	(0956.30) Machining and Machine Tools
CIP Code:	(48.0501) Machine Tool Technology/Machinist.
SAM Code (CB09) :	Possibly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000265122
Curriculum Committee Approval Date:	05/22/2024
Board of Trustees Approval Date:	07/16/2024
Last Cyclical Review Date:	05/22/2024
Course Description and Course Note:	MACH 101 covers the fundamentals of the machinist trade. Instructions on the proper care and use of precision equipment are also included. Basic training utilizing lathes, milling machines, drill presses and grinders is emphasized.
Justification:	Mandatory Revision
Academic Career:	• Credit
Mode of Delivery:	
Author:	
Course Family:	

Academic Senate Discipline

Primary Discipline:	• Machine Tool Technology (Tool and die making)
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☑ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Transferable to CSU only

Transferability Status

Approved

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	126
Total Course Out-of-Class Hours	36
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

☐ Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	1	2
Laboratory Hours	6	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	18
Laboratory	108
Studio	0
Total	126
Course Out-of-Class Hours	
Lecture	36
Laboratory	0
Studio	0
Total	36

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

No Value

Entry Standards

Entry Standards

Course Limitations

Cross Listed or Equivalent Course

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Multimedia
Methods of Instruction	Collaborative Learning
Methods of Instruction	Demonstrations

Out of Class Assignments

- Reading assignments
- Homework assignments

Methods of Evaluation	Rationale
Exam/Quiz/Test	Regular quizzes
Exam/Quiz/Test	Individual projects (e.g. hex shaft part)
Exam/Quiz/Test	Final examination

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Walker,John	Machining Fundamentals	Goodheart-Wilcox	2019	978-1-64925-979-0

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Demonstrate safety practices with machinery during milling and lathe operations.

Perform a series of fundamental machining exercises in lathe and milling operations.

Use precision inspection equipment.

Demonstrate drilling, reaming, tapping and knurling procedures.

Demonstrate the setup and utilization of various lathe and milling operations and procedures.

SLOs

Demonstrate knowledge of machine techniques. Expected Outcome Performance: 70.0

ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
MACH Machine & Manufacturing Technology Machinist AS	Demonstrate the skills required in the field of machine and manufacturing technology, such as technical mathematics.
	Demonstrate the skills required in the field of machine and manufacturing technology, such as use of manual machining equipment.
MACH Machinist - A.S. Degree Major	Demonstrate the skills required in the field of machine and manufacturing technology, such as use of manual machining equipment.
MACH Machinist - Certificate	Demonstrate the skills required in the field of machine and manufacturing technology, such as use of manual machining equipment.

Complete assignments utilizing knowledge of lathes, milling machines, drill presses and grinders. Expected Outcome Performance: 70.0

ILOs Core ILOs	Analyze and solve problems using critical, logical, and creative thinking; ask questions, pursue a line of inquiry, and derive conclusions; cultivate creativity that leads to innovative ideas.
	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
MACH Machine & Manufacturing Technology Machinist AS	Demonstrate the skills required in the field of machine and manufacturing technology, such as computer numerical machining (CNC) for various machine tools
	Demonstrate the skills required in the field of machine and manufacturing technology, such as metallurgy and heat treating.
MACH Machinist - A.S. Degree Major	Demonstrate the skills required in the field of machine and manufacturing technology, such as use of manual machining equipment.
MACH Machinist - Certificate	Demonstrate the skills required in the field of machine and manufacturing technology, such as use of manual machining equipment.

Practice machine safety procedures consistently. Expected Outcome Performance: 70.0

ILOs Core ILOs	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.
	Practice ethical and responsible behavior within personal, academic, professional, social, and societal contexts; recognize and welcome diverse lifestyle choices that promote physical, intellectual, psychological, and social well-being.
MACH Machinist - A.S. Degree Major	Demonstrate the skills required in the field of machine and manufacturing technology, such as use of manual machining equipment.
MACH Machinist - Certificate	Demonstrate the skills required in the field of machine and manufacturing technology, such as use of manual machining equipment.

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Introduction (3 hours)
- Description of major parts of the mill and lathe
- Mill and Lathe tools and their applications

How to Take Accurate Measurements (3 hours)
- Dial caliper and micrometer
- Dial indicators, test indicators

Machine Shop Safety (1 hour)
- General
- Horizontal and Vertical saw
- Milling machine
- Engine lathe

Work Holding Mill and Lathe (3 hours)
- Vise
- Indexing head
- 3 jaw chuck
- 4 jaw chuck
- collets

Milling and Lathe Operations (3 hours)
- Center drilling
- Drilling
- Reaming
- Tapping
- Boring
- Milling

- Turning

Cutting Screw Threads on the Lathe (2 hours)
- Types of threads
- Threading tools
- Thread measuring tools

Taper Turning and Tapping (1 hour)
- Tailstock set over
- Compound rest

Special Mill and Lathe Operations (2 hours)
- Knurling
- Face plate work
- Using center and follower rest
- Boring

Total hours: 18

Laboratory/Studio Content

Introduction (2 hours)
- Description of major parts of the mill and lathe
- Mill and Lathe tools and their applications

How to Take Accurate Measurements (2 hours)
- Dial caliper and micrometer
- Dial indicators, test indicators

Machine Shop Safety (3 hours)
- General
- Horizontal and Vertical saw
- Milling machine
- Engine lathe

Work Holding Mill and Lathe (3 hours)
- Vise
- Indexing head
- 3 jaw chuck
- 4 jaw chuck
- collets

Milling and Lathe Operations (4 hours)
- Center drilling
- Drilling
- Reaming
- Tapping
- Boring
- Milling
- Turning

Cutting Screw Threads on the Lathe (2 hours)
- Types of threads
- Threading tools
- Thread measuring tools

Taper Turning and Tapping (1 hour)
- Tailstock set over
- Compound rest

Special Mill and Lathe Operations (3 hours)
- Knurling
- Face plate work
- Using center and follower rest
- Boring

Laboratory Projects (88 hours)
- Milling machine projects
- Engine lathe projects

Total hours: 108

Additional Information

Is this course proposed for GCC Major or General Education Graduation requirement? If yes, indicate which requirement in the two areas provided below.

No

GCC Major Requirements

No Value

GCC General Education Graduation Requirements

No Value

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Resources

Did you contact your departmental library liaison?

No

If yes, who is your departmental library liason?

No Value

Did you contact the DEIA liaison?

No

Were there any DEIA changes made to this outline?

No Value

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

No Value

If additional resources are needed, add a brief description and cost in the box provided.

No Value