MACH103 : Machine Technology III

General Information

Author:	• Jorge Palma
Course Code (CB01) :	MACH103
Course Title (CB02) :	Machine Technology III
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) :	Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000628527
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 103 covers more advanced and complicated operations of machine tools and equipment. Precision inspection, production and assembly are studied. Lectures and demonstrations on specialized machine tools and equipment give the student a better understanding of their use and capacities.
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.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

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

Prerequisite

MACH102 - Machine Technology II (in-development)

Objectives

- Perform a series of intermediate machining exercises on the engine lathe.
- Demonstrate proper surface, cylindrical grinding, and tool grinding techniques.

Entry Standards

Entry Standards

Successfully complete a performance test to demonstrate intermediate machining skills.

Demonstrate critical thinking skills through projects, written assignments, quizzes, and examinations.

Course Limitations

Cross Listed or Equivalent Course

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Discussion
Methods of Instruction	Multimedia
Methods of Instruction	Demonstrations

Out of Class Assignments

Reading assignments

Methods of Evaluation	Rationale
Exam/Quiz/Test	Quizzes
Project/Portfolio	Related projects (e.g. hammer,bottle opener)
Exam/Quiz/Test	Final examination

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
John R Walker, Bob Dixon	Machining Fundamentals	Goodheart-Willcox	2023	978-1-64925-979-0

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

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Perform a series of intermediate machining exercises and precision inspection operations.

Explain and demonstrate proper use and handling of precision measuring instruments.

Select the appropriate device to secure various projects on the machine base.

Explain and employ appropriate safety equipment and practices.

SLOs

Design and complete intermediate-level projects and exercises on the lathe and mill. 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.

Articulate the appropriate uses for each machine and small tool. Expected Outcome Performance: 70.0

ILOs Core ILOs	Communicate clearly, ethically, and creatively; listen actively and engage respectfully with others; consider situational, cultural, and personal contexts within or across multiple modes of communication.
	Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or methodologies to solve unique problems.

Calculate measurements accurately using a range of techniques in order to cut precisely. 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.
	Use quantitative and/or analytical mathematical skills to solve problems and to interpret, evaluate, and process information and data to draw logical conclusions and support claims.

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

Sawing & Cutting (1 hour)

- Types of saws
- Blade types and applications
- Cutting operations & fluids
- Sawing safety

Milling Machine (1 hour)

- Machine nomenclature
- Machine operation
- Machine lubrication
- Machine safety

Mill Cutting Tools and Applications (2 hours)

- End mills, face mills, fly cutters
- Angle cutters, radius cutters, ball cutters, slitting & slotting saws
- Center drills, drills, taps, reamers
- Boring bars, countersinks, counterbores
- Speeds and feeds

Milling Machine Accessories (2 hours)

- Vise Indexing head
- Dividing head
- Rotary table
- Spindex

Milling Machine Operations (3 hours)

- Milling flat surfaces
- Milling ends square
- Climb & conventional milling
- Slotting & slitting
- Milling keyways & keyseats
- Boring
- Profiles & pockets

Engine Lathe (1 hour)

- Machine nomenclature
- Machine operation
- Machine Lubrication
- Machine safety

Engine Lathe Cutting Tools and Applications (2 hours)

- Facing & turning
- Grooving & cutoff
- Contouring
- Profiling
- Threading
- Speeds and feeds

Engine Lathe Accessories (2 hours)

- Tailstock
- Center rest & follower rest
- Taper attachment
- Chucks 3 & 4 jaw
- Face plate
- 5C collet closer

Engine Lathe Operations (3 hours)

- Facing
- Turning

- Grooving
- Threading
- Cut off
- Contouring & profiling

Cutting Fluids and Lubricating Compounds (1 hour)
- Description of cutting fluids
- Use of cutting fluids
- Types of cutting fluids
- Description and use of lubricating compounds
- Methods of application

Total hours: 18

Laboratory/Studio Content

Sawing & Cutting (2 hours)
- Types of saws
- Blade types and applications
- Cutting operations & fluids
- Sawing safety

Milling Machine (3 hours)
- Machine nomenclature
- Machine operation
- Machine lubrication
- Machine safety

Mill Cutting Tools and Applications (10 hours)
- End mills, face mills, fly cutters
- Angle cutters, radius cutters, ball cutters, slitting & slotting saws
- Center drills, drills, taps, reamers
- Boring bars, countersinks, counterbores
- Speeds and feeds

Milling Machine Accessories (8 hours)
- Vise Indexing head
- Dividing head
- Rotary table
- Spindex

Milling machine operations (18 hours)
- Milling flat surfaces
- Milling ends square
- Climb & conventional milling
- Slotting & slitting
- Milling keyways & keyseats
- Boring
- Profiles & pockets

Engine Lathe (3 hours)
- Machine nomenclature
- Machine operation
- Machine Lubrication
- Machine safety

Engine Lathe Cutting Tools and Applications (10 hours)
- Facing & turning
- Grooving & cutoff
- Contouring
- Profiling
- Threading
- Speeds and feeds

Engine Lathe Accessories (8 hours)
- Tailstock
- Center rest & follower rest
- Taper attachment
- Chucks 3 & 4 jaw
- Face plate
- 5C collet closer

Engine Lathe Operations (18 hours)

- Facing
- Turning
- Grooving
- Threading
- Cut off
- Contouring & profiling

Cutting Fluids and Lubricating Compounds (3 hours)

- Description of cutting fluids
- Use of cutting fluids
- Types of cutting fluids
- Description and use of lubricating compounds
- Methods of application

Projects (25 hours)

- Hammer & tips
- Table mill stop

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