

CAM240 : Basic Mastercam Lathe

General Information

Author:	<ul style="list-style-type: none">Jorge Palma
Course Code (CB01) :	CAM240
Course Title (CB02) :	Basic Mastercam Lathe
Department:	CAM
Proposal Start:	Spring 2025
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) :	CCC000628525
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:	CAM 240 is a Mastercam lathe course. Students will be introduced to the Mastercam lathe interface and creating geometry. Turning toolpaths, available in Mastercam, will be used to machine 2-Axis Lathe parts. Machining processes include a combination of Turning Face, Turning Profile, Profile Groove, Single Groove, Chamfer, Part off, and Threading Toolpaths. Stock flip operations will also be discussed.
Justification:	Mandatory Revision
Academic Career:	<ul style="list-style-type: none">Credit
Mode of Delivery:	
Author:	
Course Family:	

Academic Senate Discipline

Primary Discipline:	<ul style="list-style-type: none">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

Advisory

CAM210 - Computer Aided Manufacturing Basic Milling (in-development)

Objectives

- Perform basic interpretation of geometric shapes and translate them into the proper numeric format.
- Identify the basic principles required to successfully complete a simple project.

OR

Advisory

CAM220 - Computer Aided Manufacturing, Basic Lathe (in-development)

Objectives

- Explain the safety measures employed during the operation of a Computer Numerical Control (CNC) lathe.
 - Perform basic cutting procedures using a CNC lathe.
 - Identify the basic principles required to successfully complete a simple project.
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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

- Calculations (e.g. acceptable rotational tool speeds)
- Individual project (e.g. create a part program from a blue print)
- Group project (e.g. create a part program from a solid model)

Methods of Evaluation

Rationale

Exam/Quiz/Test

Quizzes

Exam/Quiz/Test

Practical laboratory examinations

Exam/Quiz/Test

Evaluation of final project (e.g. manifold)

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Mike Wearne, Duane Weidinger	Mastercam 2024 lathe with C&Y axis training guide	Caminstructor, Inc	2024	978-1-77851-015-1

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

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Create geometry and toolpaths for CNC lathe.

Set up a Computer Numerical Control (CNC) lathe.

Demonstrate roughing and finishing.

Demonstrate drilling and boring.

Evaluate the geometry of a part.

Perform stock flip toolpath for second operation.

SLOs

Demonstrate programming with Mastercam lathe software.

Expected Outcome Performance: 70.0

CAM
A.S. Computer Numerical
Control Technician

Apply various software programs to write CNC code for the production of manufactured parts.

Use manual machine and CNC machine tools to produce manufactured parts.

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.

Explain safe and appropriate part handling for a CNC lathe.

Expected Outcome Performance: 70.0

ILOs Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities, theories, or
Core methodologies to solve unique problems.
ILOs

Verify CNC lathe programs using back-plot.

Expected Outcome Performance: 70.0

CAM Apply various software programs to write CNC code for the production of manufactured parts.
A.S. Computer Numerical
Control Technician

ILOs Demonstrate depth of knowledge in a course, discipline, or vocation by applying practical knowledge, skills, abilities,
Core ILOs theories, or methodologies to solve unique problems.

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

General Introduction (2 hours)

- History of Computer Numerical Control (CNC) programming and machining
- Review of machining basics
- Preparation for CNC machining

Lathe Machining Setup in Mastercam (3 hours)

- Setting up Mastercam configuration
- Orientation of the part
- Part zero in Mastercam
- Stock setup in Mastercam

Creating Geometry (3 hours)

- Creating lines, arcs, and points
- Extract geometry from solid models
- Diameter/radius part creation
- Use levels, groups, and attributes

Modifying Current Geometry (3 hours)

- Trim entities
- Divide and join entities
- Modify length
- Break two pieces
- Add fillet radius and chamfer
- Offset geometry
- Project geometry Geometry
- Transformation (scale, rotate, etc.)

Lathe Toolpaths (3 hours)

- Facing the part
- Roughing and finishing the profile
- Grooving inside and outside of the part
- Apply threading toolpath
- Use drilling
- Part off the part

Part Handling in Mastercam (2 hours)

- Set up stock and chuck
- Using planes
- Stock flip
- Advance tailstock
- Lathe tool manager
- Toolpath transform

Set up a CNC Lathe Machine (2 hours)

- Load a desire work holding fixture on the machine
- Indicate the part
- Load proper tool holders
- Find part zero
- Set up tools
- Verify and run part

Total hours: 18

Laboratory/Studio Content

Lathe Machining Setup in Mastercam (18 hours)

- Setting up Mastercam configuration
- Orientation of the part
- Part zero in Mastercam
- Stock setup in Mastercam

Creating Geometry (18 hours)

- Creating lines, arcs, and points
- Extract geometry from solid models
- Diameter/radius part creation
- Use levels, groups, and attributes

Modifying Current Geometry (16 hours)

- Trim entities
- Divide and join entities
- Modify length
- Break two pieces
- Add fillet radius and chamfer
- Offset geometry
- Project geometry Geometry
- Transformation (scale, rotate, etc.)

Lathe Toolpaths (18 hours)

- Facing the part
- Roughing and finishing the profile
- Grooving inside and outside of the part
- Apply threading toolpath
- Use drilling
- Part off the part

Part Handling in Mastercam (18 hours)

- Set up stock and chuck
- Using planes
- Stock flip
- Advance tailstock
- Lathe tool manager
- Toolpath transform

Set up a CNC Lathe Machine (20 hours)

- Load a desire work holding fixture on the machine
- Indicate the part
- Load proper tool holders
- Find part zero
- Set up tools
- Verify and run part

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 liaison?

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

