

EICC COURSE DEVELOPMENT MODEL (CDM)

CATALOG COURSE NUMBER: MFG-372

COURSE TITLE: SolidWorks/MasterCam Applications

Originating College: CCC MCC SCC

Effective Term/Year: Fall 2015

Initiating Faculty Member: Bradley McConnell

Initiating Department Coordinator: Ben Kettering

Reason for submission: Check all that apply

New Course If yes, type of course:

A&S

To be considered for General Education? Yes No Category:

To be part of an A & S Concentration? Yes No Concentration:

CTE Program Title: Mechanical Design Technology Required Elective

General Education or Program Review Reactivation of an inactive course Making course inactive

Changing course; please explain:

Other; please explain:

Contact Hours/Distribution of Contact Hours

Lecture Hours

Lab Hours

Clinical Hours

Coop Hours

Hours per Week: 1.00 Hours per Week: 4.00 Hours per Week: Hours per Week:

Number of Weeks: 16.50 Number of Weeks: 16.50 Number of Weeks: 16.50 Number of Weeks: 16.50

****Note: If offering a course for the full fall or spring semester, the number of weeks is 16.5**

Total Lecture Hrs: 19.80 Total Lab Hrs: 79.20 Total Clinical Hrs: Total Coop Hrs:

Semester Hours Credit: 3.00 if variable credit, give range:

Allow repeat* for credit: Yes No

If yes, total course repeats allowed: If yes, total credits:

*Note that repeat for credit means a student can pass the course and then repeat it for additional credit. An internship course is an example of a course that could be set up as repeatable for additional credit

Course or courses this CDM replaces, if any: None

CATALOG COURSE DESCRIPTION: This is an introductory course focusing on the creation of real parts using Computer Aided Design/Computer Aided Manufacturing software and Computer Numerical Control machine tools. Students will create 3-dimensional parts using SolidWorks parametric modeling software. Students will then export those part files to Mastercam CAM software and process the part files to be machined using a CNC mill.

RECOMMENDED ENTRY LEVEL SKILLS/KNOWLEDGE:

PRE-REQUISITE COURSES

CCN#	COURSE TITLE
DRF 132	Basic Drafting and Design II or
MFG 192	Blueprint Reading

CO-REQUISITE COURSES

CCN#	COURSE TITLE

PUBLISHED MATERIAL(S) USED FOR CDM DEVELOPMENT: Manton, Matthew. SolidWorks & Mastercam X7 Training Guide - Mill 3D. Kitchener, ON:CamInstructor Inc., 2013. Print.

In general it is expected that source material will be dated within 5 years of this CDM date. If all materials/ textbooks

cited above are older than this, please explain:

GENERAL COURSE GOALS

Upon successful completion of this course the student should be able to:

- Create 3D models using SolidWorks.
- Import part model files into Mastercam.
- Setup part models in Mastercam and create toolpath information.
- Post process Mastercam files.
- Create real parts on a CNC mill.

TOPICAL OUTLINE

1. Setting the Mastercam environment.
2. Create protrusions and cuts from 2D sketches in SolidWorks.
3. Create 3D models using section profiles and guidecurves in SolidWorks.
4. Create 3D models using lofted and swept cuts in SolidWorks.
5. Design 3D parts using the rib function in SolidWorks.
6. Generate and create parts using MaterCam.

COURSE OBJECTIVES

Upon successful completion of the course, a student should be able to:

1. Setting the Mastercam environment.
 - a. Define the grid display.
 - b. Display relevent toolbars.
 - c. Define machine type.
 - d. Define units of measurement.
2. Create protrusions and cuts from 2D sketches in SolidWorks.
 - a. Define 2D sketches in SolidWorks.
 - b. Extrude 2D sketches.
 - c. Revolve 2D sketches.
3. Create 3D models using section profiles and guide curves in SolidWorks.
 - a. Generate section profiles in SolidWorks.
 - b. Create guide curves in SolidWorks.
 - c. Generate 3D models from from sketches.
4. Create 3D models using lofted and swept cuts in SolidWorks.
 - a. Using fully defined sketches generate 3D cavities using the swept cut tool.
 - b. Using fully defined sketches generate 3D cavities using the loft tool.
5. Design 3D parts using the rib function in SolidWorks.
 - a. Create 2D sketches of rib features using SolidWorks.
 - b. Generate rib features using the rib tool.
6. Generate and create parts using MasterCam.
 - a. Import and reposition the Computer Aided Design (CAD) file.
 - b. Define rough stock using setup.
 - c. Rough out surface.
 - d. Verify rough toolpath and save Stereolithography (STL) file.
 - e. Complete finish cut.
 - f. Verify finish toolpath.
 - g. Post and create Computer Numerical Control (CNC) code file.

RECOMMENDED METHODS OF INSTRUCTION: *Check all appropriate methods of instruction to facilitate student learning of course objectives.*

- | | | |
|---|--|---|
| <input type="checkbox"/> Case Studies | | <input checked="" type="checkbox"/> Class Discussions |
| <input checked="" type="checkbox"/> Computer lab work | | <input checked="" type="checkbox"/> Computer-assisted tools |
| <input type="checkbox"/> Computer-assisted writing | | <input type="checkbox"/> Conducting experiments |
| <input checked="" type="checkbox"/> Demonstration or modeling | | <input type="checkbox"/> Electronic interaction |
| <input type="checkbox"/> Field observation | | <input type="checkbox"/> Field trips |

- | | |
|--|--|
| <input type="checkbox"/> Guest speaker | <input type="checkbox"/> Guided practice |
| <input type="checkbox"/> In-class writing or editing workshops | <input type="checkbox"/> Journals |
| <input checked="" type="checkbox"/> Lecture | <input type="checkbox"/> Library instruction and resources |
| <input checked="" type="checkbox"/> Model building | <input type="checkbox"/> Peer review |
| <input type="checkbox"/> Readings | <input type="checkbox"/> Role play |
| <input type="checkbox"/> Service learning | <input checked="" type="checkbox"/> Simulation |
| <input type="checkbox"/> Student and instructor conferences | <input checked="" type="checkbox"/> Student collaborative learning |
| <input type="checkbox"/> Student presentation | <input type="checkbox"/> Student projects |
| <input type="checkbox"/> Tests or quizzes | <input type="checkbox"/> Worksheets/surveys |
| <input type="checkbox"/> Writing assignments/exercises (graded or not) | |
| <input checked="" type="checkbox"/> Other (please list specifics): CNC machining lab work. | |

RECOMMENDED EVALUATION METHODS: Check all appropriate methods of evaluation to assess student achievement of course objectives.

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|---|---|
| <input checked="" type="checkbox"/> Class workshops | <input type="checkbox"/> Classroom discussions/participation |
| <input type="checkbox"/> Collaborative work | <input checked="" type="checkbox"/> Demonstration of skill(s) |
| <input type="checkbox"/> Individual conferences | <input type="checkbox"/> Journals |
| <input type="checkbox"/> Laboratory reports | <input type="checkbox"/> Oral presentations |
| <input type="checkbox"/> Portfolios | <input type="checkbox"/> Pretest/Posttest |
| <input type="checkbox"/> Quizzes | <input type="checkbox"/> Reading responses |
| <input type="checkbox"/> Student presentations | <input checked="" type="checkbox"/> Student projects |
| <input checked="" type="checkbox"/> Tests | <input type="checkbox"/> Writing Assignments |
| <input type="checkbox"/> Other (please list specifics): | |

ATTENDANCE: Policies on attendance will be formulated by the instructor and communicated to the students on the course syllabus.

ACADEMIC DISHONESTY: Policies on academic dishonesty can be found in the EICC student code of conduct published in the student handbook.

CDM CREATION/REVIEW/REVISION INFORMATION	
Originally Written by:	Date:
Department Chair, Comments, & Date:	
Does similar curriculum exist at other EICC Colleges? <input type="checkbox"/> CCC <input type="checkbox"/> MCC <input type="checkbox"/> SCC <input type="checkbox"/> No	
If yes, Counterparts Consulted, College, Comments & Date:	
CDM Review or Revision Date:	
Faculty member(s) & College:	
Does similar curriculum exist at other EICC Colleges? <input type="checkbox"/> CCC <input type="checkbox"/> MCC <input type="checkbox"/> SCC <input type="checkbox"/> No	
Changes made to course which will require further review steps:	
<input type="checkbox"/> Making course inactive <input type="checkbox"/> Credit hours <input type="checkbox"/> Contact hours <input type="checkbox"/> Course Description	
<input type="checkbox"/> 25% or more of course objectives <input type="checkbox"/> Other minor revisions or no revisions	
Dean Review, Comments & Date:	

If changes made require further review and approval:

College Curriculum Committee Sign-off & Date:

IC Review Subcommittee Sign-off & Date:

Instructional Council Approval: