

Washtenaw Community College Comprehensive Report

NCT 259 MasterCam 2D and 3D CAM CNC Programming for Mills Effective Term: Fall 2016

Course Cover

Division: Advanced Technologies and Public Service Careers

Department: Industrial Technology

Discipline: Numerical Control

Course Number: 259

Org Number: 14400

Full Course Title: MasterCam 2D and 3D CAM CNC Programming for Mills

Transcript Title: MasterCam 2D & 3D CAM CNC Prog

Is Consultation with other department(s) required: No

Publish in the Following:

Reason for Submission: New Course

Change Information:

Rationale: This class is being created for an advanced certificate in the advanced manufacturing program. This course is needed to get students skills to operate new equipment being purchased for our program.

Proposed Start Semester: Fall 2016

Course Description: In this course, students develop skills required to operate MasterCam software used to create 2D and 3D tool paths for milling operations. Basic understanding of file and menu structures for CAD and/or CAD CAM systems will be required for this class. Many of the menu selections, icons and tool pallet choices will be similar to those studied in the manual programming classes.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 45 **Student:** 45

Lab: Instructor: 45 **Student:** 45

Clinical: Instructor: 0 **Student:** 0

Total Contact Hours: Instructor: 90 **Student:** 90

Repeatable for Credit: NO

Grading Methods: Letter Grades

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

No Level Required

Requisites

Prerequisite

NCT 221 minimum grade "c"

General Education

Request Course Transfer

Proposed For:
Eastern Michigan University

Student Learning Outcomes

1. Apply CAD CAM software to create 2D & 3D geometry.

Assessment 1

Assessment Tool: Capstone project art to program

Assessment Date: Fall 2019

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: departmentally-developed rubric

Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Department faculty

2. Apply proper methods for creating 2D tool paths for milling operations.

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3. Apply proper methods for creating 3D tool paths for milling operations.

Assessment 1

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Standard of success to be used for this assessment: 75% of students will score 75% or higher.

Who will score and analyze the data: Department Faculty

Course Objectives

1. Know how to open and save files.
2. Know how navigate the menu structures.
3. Use view control and layers to organize geometry in the part models.
4. Use the display functions (zoom, pan, rotate, fit, refresh).
5. Manipulate geometry (delete, edit color, move to layers).
6. Create point or points using all options in the "point" and "points" menu structure.
7. Create lines using all options in the menu structure.
8. Create circles using all options in the menu structure.
9. Create and control contour tool path geometry using tool pallet menu structure.
10. Apply view control rules to create geometry in 3D space.
11. Learn how to use all functions involving drill control.
12. Apply tool path geometry to drilling and other hole producing operations using cut control options within the tool path pallets.
13. Apply tool path geometry to face cutting using cut control options within the tool path pallets.

14. Apply tool path geometry to contour cutting operations using cut control options within the tool path pallets.
15. Apply tool path geometry to produce slots of varying depth using geometry and cut control options within the tool path pallets.
16. Apply tool path geometry to circular pockets using cut control options within the tool path pallets.
17. Apply tool path geometry to irregular shaped pockets using cut control options within the tool path pallets.
18. Apply tool path geometry to irregular shaped pockets with islands using cut control options within the tool path pallets.
19. Apply proper methods for machining single surface features (ruled, section, extruded and more).
20. Apply proper methods for machining multiple surface features (extruded, drive curves, swept surfaces and more).
21. Edit the surfaces to create smooth transitions (blending, fillet, corner rounding, and more).
22. Generate tool paths using a range of methods (Roughing, Finishing, Dynamic Opti-rough, Rough Plunge, Rough Pocket, Finish Contour and more).
23. Apply concepts within tool pallets to control surface finish and optimize time.

New Resources for Course

Course Textbooks/Resources

Textbooks

Manton, Matthew & Weldinger, Duane. *Mastercam X9 Training Guide - Mill 2D&3D*, X9 ed. Kitchner Ontario: Cam Instructor Inc., 2015, ISBN: 978-1-927359-.

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Computer workstations/lab

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Thomas Penird</i>	<i>Faculty Preparer</i>	<i>Aug 29, 2015</i>
Department Chair/Area Director: <i>Thomas Penird</i>	<i>Recommend Approval</i>	<i>Aug 29, 2015</i>
Dean: <i>Brandon Tucker</i>	<i>Recommend Approval</i>	<i>Oct 06, 2015</i>
Curriculum Committee Chair: <i>Kelley Gottschang</i>	<i>Recommend Approval</i>	<i>Nov 30, 2015</i>
Assessment Committee Chair: <i>Michelle Garey</i>	<i>Recommend Approval</i>	<i>Dec 01, 2015</i>
Vice President for Instruction: <i>Michael Nealon</i>	<i>Approve</i>	<i>Dec 14, 2015</i>