EICC COURSE DEVELOPMENT MODEL (CDM)

CATALOG COURSE NUMBER: MFG-239
COURSE TITLE: Lathe Programming
Originating College: ☐CCC ☐MCC ☑SCC Effective Term/Year: Fall 2015
Initiating Faculty Member: Kenneth Darmody 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: ☐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:	2.00	Hours per Week:	0	Hours per Week:	0
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:	39.60	Total Clinical Hrs:	0	Total Coop Hrs:	0

Semester Hours Credit: 2.00 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:

CATALOG COURSE DESCRIPTION: This course will introduce students to Computer Numeric Control (CNC) programming concepts in manufacturing settings. Various projects will strengthen the student's proper use, programming and troubleshooting of this equipment in the manufacturing setting.

RECOMMENDED ENTRY LEVEL SKILLS/KNOWLEDGE: Ability to use measuring tools.

PRE-REQUISITE COURSES

CCN#	COURSE TITLE
MFG 201	CNC Turning Operator

CO-REQUISITE COURSES

CCN#	COURSE TITLE

PUBLISHED MATERIAL(S) USED FOR CDM DEVELOPMENT: Smith, Robert D., and John C. Peterson. Mathematics for Machine Technology. Clifton Park: Delmar Cengage Learning, 2009. Print.
Amatrol. CNC Operator Program: HAAS Based Interface. Amatrol, 2009. Web.

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:

Calculate toolpaths.
Write accurate programs, including canned cycles and grid and machine codes (G-Codes and M-Codes).
Safely troubleshoot the program.
Create an accurate first piece.

TOPICAL OUTLINE

1. Programming Introduction
2. Programming Safety
3. Machine Reference Points
4. Part Drawing to Program
5. Program Structure
6. G-Code Definitions
7. M-Code Definitions
8. Programming Compensations
9. Subroutines and Subprograms
10. Advanced Editor
11. Visual Quick Code
12. Common Tasks
13. Program Writing Tasks

COURSE OBJECTIVES

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

1. Programming introduction
   a. Identify why NC and CNC machines were developed.
   b. Describe the functions of current CNC technology.
   c. Identify the advantages and disadvantages of CNC machines.
2. Programming safety
   a. Describe general dangers related to the equipment.
   b. Identify why the programming safety block is used in a program.
3. Machine reference points
   a. Identify the correct coordinate system setting.
   b. Select the correct program plane.
4. Part drawing to program
   a. Identify the correct measurement units.
   b. Describe the general machining area.
   c. Program tool offsets correctly.
5. Program structure
   a. Describe and define machine home zero.
   b. Identify programmed part zero.
   c. Identify proper feeds and speeds.
   d. Identify proper X and Z axis values of a part program.
6. G-Codes definitions
   a. Describe what G-Codes are.
   b. Identify G-Code commands and functions in a program.
7. M-Code definitions
   a. Describe what M-Codes are.
   b. Identify M code commands and functions in a program.
8. Programming compensations
   a. Identify tool nose compensation.
   b. Describe X and Z axis compensations.
9. Subroutines and subprograms
   a. Describe how to create a subroutine.
   b. Describe how to create a subprogram.
10. Advanced editor
   a. Identify how to compensate for tool wear in the part program.
   b. Describe proper procedure to edit program entries.

11. Visual quick code
    a. Describe how to use visual quick code.
    b. Identify how to enter information in a quick code program.
12. Common tasks
    a. Set up lathe programs.
    b. Load lathe programs.
    c. Run lathe programs.
13. Program writing tasks
    a. Create lathe programs from part drawings.
    b. Verify programs using machine simulator.

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

☐ Case Studies	☑ Class Discussions
☐ Computer lab work	☐ Computer-assisted tools
☐ Computer-assisted writing	☐ Conducting experiments
☑ Demonstration or modeling	☐ Electronic interaction
☐ Field observation	☐ Field trips
☐ Guest speaker	☑ Guided practice
☐ In-class writing or editing workshops	☐ Journals
☑ Lecture	☐ Library instruction and resources
☐ Model building	☐ Peer review
☐ Readings	☐ Role play
☐ Service learning	☐ Simulation
☑ Student and instructor conferences	☐ Student collaborative learning
☐ Student presentation	☑ Student projects
☐ Tests or quizzes	☐ Worksheets/surveys
☐ Writing assignments/exercises (graded or not)	
☑ Other (please list specifics): Videotapes, Mill Project	

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

☐ Class workshops	☐ Classroom discussions/participation
☐ Collaborative work	☑ Demonstration of skill(s)
☑ Individual conferences	☐ Journals
☐ Laboratory reports	☐ Oral presentations
☐ Portfolios	☐ Pretest/Posttest
☑ Quizzes	☐ Reading responses
☐ Student presentations	☑ Student projects
☑ Tests	☐ Writing Assignments
☐ 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? ❑CCC ❑MCC ❑SCC ❑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? ❑CCC ❑MCC ❑SCC ❑No	
Changes made to course which will require further review steps:	
❑ Making course inactive ❑ Credit hours ❑ Contact hours ❑ Course Description	
❑ 25% or more of course objectives ❑ 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:	