Clackamas Community College

Online Course/Outline Submission System

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Section #1 General Course Information

Department: Manufacturing

Submitter

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Course Prefix and Number: MET - 153

 # Credits: 6

Contact hours

Lecture (# of hours):
Lec/lab (# of hours): 120
Lab (# of hours):
Total course hours: 120

For each credit, the student will be expected to spend, on average, 3 hours per week in combination of in-class and out-of-class activity.

Course Title: Computer-Integrated Manufacturing - Project Lead the Way

Course Description:

The course applies the principles of robotics and automation to engineering and manufacturing. Students use Computer Numerical Control (CNC) equipment to produce physical models from three-dimensional Computer Aided Drafting (CAD) files. This course is part of the national Project Lead the Way curriculum.

Type of Course: Career Technical Preparatory

Is this class challengeable?

No

Can this course be repeated for credit in a degree?

No

Is general education certification being sought at this time?

No

Does this course map to any general education outcome(s)?

No

Is this course part of an AAS or related certificate of completion?

No

Are there prerequisites to this course?

No

Are there corequisites to this course?

No

Are there any requirements or recommendations for students taken this course?

No

Are there similar courses existing in other programs or disciplines at CCC?

No

Will this class use library resources?

Yes

Have you talked with a librarian regarding that impact?

No

Is there any other potential impact on another department?

No

Does this course belong on the Related Instruction list?

No

GRADING METHOD:

A-F or Pass/No Pass

Audit: Yes

When do you plan to offer this course?

✓ Not every term

Is this course equivalent to another?

If yes, they must have the same description and outcomes.

No

Will this course appear in the college catalog?

Yes

Will this course appear in the schedule?

Yes

Student Learning Outcomes:

Upon successful completion of this course, students should be able to:

1. use Computer Aided Design (CAD) software to produce part models and engineering drawings;
2. identify the need for rapid-prototyping (RP), describe common RP technologies and create prototype models from a drawing data base;
3. create a simple numerical control (NC) part program using a text editor and use verification software to correct errors found in NC part files;
4. safely setup, maintain and operate a CNC machine center using appropriate documentation and procedures;
5. make precision measurements to the degree of accuracy required by plan specification using appropriate instruments;
6. perform basic operations with computer-aided manufacturing (CAM) software to manage files, and import and edit part programs and geometry;
7. investigate career opportunities in the automation field;
8. use simulation software to plan a robotic motion control program and then apply the program to an actual material handling problem with a physical robot;
9. implement industrial process control using a Programmable Logic Controller (PLC);
10. design, assemble and test a complete, scaled Flexible Manufacturing System (FMS) built from individual automation modules using commercial modeling components.

This course does not include assessable General Education outcomes.

Major Topic Outline:

1. computer modeling
a. fundamentals
b. two-dimensional object construction
c. parts modeling
d. creation of drawing view
e. surface modeling
f. assembly modeling
g. prototyping
2. CNC machining
a. history of programmable machining
b. CNC characteristics
c. CNC programming
d. CNC operations
e. precision measurements
f. CAM software
3. robotics
a. introduction to robotics
b. robotics and automated systems
c. robot characteristics
d. mechanical components
e. control systems
f. programming methods
g. industrial robot applications

4. computer integrated manufacturing
a. rationale for CIM manufacturing
b. types of CIM systems
c. components of CIM systems
d. CIM system applications

Does the content of this class relate to job skills in any of the following areas:

1. Increased energy efficiency	**No**
2. Produce renewable energy	**No**
3. Prevent environmental degradation	**No**
4. Clean up natural environment	**No**
5. Supports green services	**No**

Percent of course: 0%

First term to be offered:

Next available term after approval

: