MACH 211 - Machine Technology 4 Course Outline

Approval Date: 03/12/2020
Effective Date: 08/14/2020

SECTION A

Unique ID Number	CCC000115733
Discipline(s)	Machine Tool Technology
Division	Career Education and Workforce Development
Subject Area	Machine Tool Technology
Subject Code	MACH
Course Number	211
Course Title	Machine Technology 4
TOP Code/SAM Code	0956.30 - Machine Tool Technology/Machinist* / B - Advance Occupational
Rationale for adding this course to the curriculum	To change lab and lecture hours. Also, to eliminate redundancy with SLOs with prerequisite courses.
Units	7
Cross List	*N/A*
Typical Course Weeks	18

Total Instructional Hours

	Contact Hours
Lecture	72.00
Lab	180.00
Activity	0.00
Work Experience	0.00
Outside of Class Hours	180.00

Total Contact Hours	270
Total Student Hours	450
Open Entry/Open Exit	No
Maximum Enrollment	
Grading Option	Letter Grade or P/NP
Distance Education Mode of Instruction	On-Campus

SECTION B

General Education Information:

SECTION C

Course Description

Repeatability May be repeated 0 times

Catalog Description An advanced course in the Machine Tool Technology degree program. This course emphasizes advanced skills in the operation and programming of CNC (computer numerical controlled) machines, utilizing skills developed in Machine Technology 1, 2, and 3. This course further develops skills in the use of precision measuring instruments, the reading of prints and engineering drawings, and provides students with an intermediate overview of the programming and operation of CNC vertical machining centers and CNC turning centers along with hands-on operation of hand tools, grinders, engine lathes and vertical milling machines.

Schedule Description

SECTION D

Condition on Enrollment

1a. Prerequisite(s)

- MACH 210

1b. Corequisite(s): *None*

1c. Recommended

- TECH 107

1d. Limitation on Enrollment: *None*

SECTION E

Course Outline Information

1. Student Learning Outcomes:

A. Perform calculations related to CNC programming.
B. Complete advanced operations on CNC machines.
C. Program CNC machines.
D. Use computer-aided manufacturing software to program CNC machines.

2. Course Objectives: Upon completion of this course, the student will be able to:

A. Work safely and accurately in a manufacturing environment.
B. Perform calculations related to CNC programming.
C. Measure machined parts with precision measurement instruments.
D. Complete advanced operations on CNC machines.
E. Program CNC machines.
F. Use MasterCam software to program CNC machines.
G.

3. Course Content

A. Safety in a manufacturing environment
B. CNC lathe operation
C. CNC machining center operation
D. Programming of CNC lathes
E. Programming of CNC machining centers
F. Trigonometry in CNC programming
G. Programming using MasterCam software

H.

4. Methods of Instruction:

Lab:

Lecture:

Projects:

5. Methods of Evaluation: Describe the general types of evaluations for this course and provide at least two, specific examples.

Typical classroom assessment techniques

Projects --

Home Work --

Lab Activities --

Final Exam --

Mid Term --

Additional assessment information:

Students will be given written homework covering assigned reading and weekly lectures. (example: lab assignment #1 "Penny Machine Top"; writing a program to machine a 2D contour).

Students will be given a written midterm exam and a written final exam. (example: a midterm and a final exam consisting of math problems and program writing problems).

Students will complete weekly lab assignments. (example: lab assignment #1 "Penny Machine Top"; writing a program to machine a 2D contour).

Letter Grade or P/NP

6. Assignments: State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

A. Reading Assignments

1. Students will be required to read their notes from lab lectures in order to perform their lab assignments. (example: notes from lecture on cutter diameter compensation, ?C&C Programming Handbook?, Krar, textbook).

2. Students will be required to read weekly assignments from the textbooks in preparation for lectures and for lab assignments. (example: lecture on canned cycles, ?C&C Programming Handbook?, Krar, textbook).

B. Writing Assignments

1. Students will be required to read the assigned portions of the textbook to determine the correct procedure for machining a part. (example: notes from the lecture on canned cycles, ?C&C Programming Handbook?, Krar, textbook).

2. Students will be required to take notes on the procedures for completion of lab assignments. (example: notes from lecture on procedures for machining a pump packing gland flange).

3. Students will analyze the drawings given to them and formulate a strategy for machining the assigned part. (example: lab assignment #3, machining of a packing gland flange).

C. Other Assignments

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7. Required Materials

A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.

Book #1:

Author: Oberg, Jones, Horton, & Ryffel

Title: Machinery's Handbook
Publisher: Industrial Press
Date of Publication: 2016
Edition: 30th

Manual #1:
Author: Haas Automation, Inc.
Title: Mill Series Programming Workbook
Publisher: Haas Automation, Inc.
Date of Publication: 02-24-2015

Manual #2:
Author: Haas Automation, Inc.
Title: Lathe Series Programming Workbook
Publisher: Haas Automation, Inc.
Date of Publication: 02-14-2015

B. Other required materials/supplies.