

ADVM 0068 - ADVANCED MILL 4TH AND 5TH AXIS

Catalog Description

Prerequisite: Completion of ADVM 67 with grade of "C" or better
Hours: 90 (36 lecture, 54 laboratory)

Description: Advanced CNC machining 4th and 5th axis Mill work. Developing complicated part geometry with Computer Aided Design (CAD), Post process CAM tool path development, planning machine operations, and developing machine codes and techniques for cost effectiveness. CNC Lathe operations. (CSU)

Course Student Learning Outcomes

- CSLO #1: Model CAM in 5 axis CNC Mill applications to industry standards.
- CSLO #2: Apply CAM in 5 axis CNC Mill applications to industry standards.

Effective Term

Fall 2020

Course Type

Credit - Degree-applicable

Contact Hours

90

Outside of Class Hours

72

Total Student Learning Hours

162

Course Objectives

Lecture:

1. Identify safe work expectations when using CNC equipment
2. Outline CAM process to create finished part
3. Explain work holding
4. Outline Industry machining coordinate systems
5. Explore tolerances and metro-logy standards
6. Compare process when different material are specified

Laboratory:

1. Apply shop safe practices. Build team safety and quality control system used in the learning environment
2. Prepare CAD process for creating CAM application render assigned project
3. Develop program operation - dry run and modeling using computer assisted programming
4. Demonstrate CNC machining center set-up and operation using created design
5. Demonstrate measuring and inspection techniques.
6. Measure and compare CAD specifications with completed part geometry and provide logical recommendations for

corrections

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

- CSU Transferable

Methods of Evaluation

- Problem Solving Examinations
 - Example: Students are provided a blueprint and a sample part, in which the student will develop a job sheet identifying operational steps to manufacture the sample using CNC Mill.
- Projects
 - Example: Students will be evaluated on their ability to make a part from a computer model, followed by machining it and final inspection.
- Skill Demonstrations
 - Example: Using the above planning process, the student will develop a job sheet identifying operational steps to manufacture the sample using the CNC Mill.

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion
- Distance Learning

Lab:

1. Laboratory demonstration of sacrifice plate or sub plate vs soft jaw work holding along with the other various types of work holding systems. Students will practice using multiple work holding methods.

Lecture:

1. Instructor presents lecture tool pathing of a five axis part. Students will utilize CAM modeling to plan tool path sequencing.

Typical Out of Class Assignments Reading Assignments

1. Read section in textbook on program planning and complete the end of chapter review questions. 2. Read chapter in textbook on screw thread technology and complete the review questions at the end of the chapter. Be prepared to discuss in class.

Writing, Problem Solving or Performance

1. Perform computation of tool path centerline and apply cutter compensation. 2. Planning a job project from start to finish on multi-axis CNC machines.

Other (Term projects, research papers, portfolios, etc.)

Required Materials

- Machining and CNC Technology
 - Author: Michael Fitzpatrick
 - Publisher: McGraw-Hill
 - Publication Date: 2018
 - Text Edition: 4th
 - Classic Textbook?:
 - OER Link:
 - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.