

Virginia Western Community College

CAD 226

Computer Aided Machining

Prerequisites

CAD 111- Introduces technical drafting from the fundamentals through advanced drafting practices. Teaches lettering, metric construction, technical sketching, orthographic projection, sections, intersections, development, fasteners, theory and applications of dimensioning and tolerances. Includes pictorial drawing, and preparation of working and detailed drawings.

MEC 119 -Teaches the basic concepts of Computer Numerical Control (CNC) programming of Numerical Control Machinery with emphasis on Computer Aided Manufacturing (CAM)/ Computer Aided Drafting (CAD). Program writing procedures will be based on using the following: basic G-code programming language for CNC machinery, CAD/CAM programming systems to produce correct code for CNC Machinery, basic computer usage, CAD/CAM integration, and Code-to machine transfer via Distributive Numeric Control (DNC)

Corequisites

none

Course Description

CAD 226 teaches the use of software to create numerical machine code to drive CNC milling machines or lathes. Introduces software and techniques to create, edit and produce CAD drawings, tool paths, and the numerical code for a CAM machine. Includes history, applications, hardware and software requirements, terminology, limitations and future trends.

Semester Credits: 3 Lecture Hours: 2 Lab Hours: 2

Required Materials

Textbook:

Resources provided by instructor

Software:

Other Required Materials:

Tooling University, online subscription, purchased through Tooling U bookstore(online) to receive student discount

Course Outcomes

At the completion of this course, successful students will

- Determine workpiece specs such as weight, length, tolerances, or feature complexity for the capability of each mill.
- Determine workpiece specs such as weight, length, diameter, tolerances, or feature complexity for the capability of each lathe.
- Demonstrate an original program for a new part on the lathe, adjusting the program as necessary.
- Translate a new part characteristic from a print into a program, incorporating tool and machine moves on the lathe.
- Demonstrate a program for a new part on the mill, adjusting the program as necessary.
- Translate a new part characteristic from a print into a program, incorporating tool and machine moves on the mill.
- Program and run a peck drilling canned cycle; program and run a boring canned cycle.
- Demonstrate conversion of manufacturer-recommended variables such as sfm and ipr into rpm and ipm; for a mill
- Demonstrate conversion of manufacturer-recommended variables such as sfm and ipt into rpm and ipm.
- Demonstrate proficiency and teamwork skills in the laboratory.

Topical Description

- History and Definition of the CNC
- Mechanics of CNC
- Basics of the CNC
- Turning Center
- Basics of the CNC Machining
- Basics of the CNC Swiss-Type Lathe 135
- CNC Coordinates
- Part Program
- CAD/CAM Overview
- CNC Manual Operations
- CNC Offsets
- CNC Specs for the Mill
- CNC Specs for the Lathe
- Creating a Turning Program
- Turning Calculations

- Creating a Milling Program
- Milling Calculations
- Canned Cycles

Notes to Instructors

Beginning Fall 2020, VWCC will require students to have a computer or reliable access to a computer, capable of participation in an online format. Online courses at Virginia Western require a significant amount of interaction with Canvas, the Learning Management System, and many require real-time class sessions using the Zoom web-conferencing tool. To be successful in online classes, students must have substantial access to a computer with hi-speed internet connectivity. The expected requirements are listed on the college webpage.

[TITLE IX STATEMENT](#)

[ADA STATEMENT](#)