

Virginia Western Community College

MEC 128

Software Foundations in Engineering Technology

Prerequisites

MDE 10 Introduction to Algebra. Covers topics in arithmetic through introduction to variables and equations.

VCCS Course Description

Introduces foundational software tools in engineering technology. Teaches software design for mechanical and electrical systems, and high-level language microcomputer programming. Covers software communication skills in word processing, spreadsheet analysis, slide deck presentations, and cloud-based storage. Applies software tools to technology labs and projects.

VWCC Discipline Specific Course Description

Same as above.

Semester Credits: 3

Lecture Hours: 2

Lab Hours: 2

Required Materials

1. Microsoft Word, Excel, PowerPoint
 - a. Office 365 Pro Plus is available free to all students.
<https://www.viriniawestern.edu/iet-services/services/software-hardware/microsoft/>
2. Autodesk Inventor, National Instruments Multi-Sim, Ki-CAD and Arduino
 - a. All software is available on campus computers and can be downloaded for free by students.
3. Access to a Google or Office 365 Drive.

Textbook

None

Other Required Materials:

None

VCCS COURSE OUTCOMES

At the completion of this course, the student should be able to:

- Describe industry standard software tools for Computer Aided Design (CAD).
- Flow chart a product development process showing critical steps and applications of software tools.
- Demonstrate software communication skills in cloud-based storage, word processing, spreadsheet analysis, slide decks presentations, and professional emails.
- Define mechanics, mechanical devices and systems, and the process of mechanical simulation.
- Demonstrate basic simulations in mechanical CAD software.
- Define electronics, electrical devices and systems, and the process of electrical stimulation.
- Demonstrate basic simulations in electronic CAD software.
- Define high level language microcomputer coding and the process of instructing hardware.
- Create programming code to operate hardware.
- Describe software driven manufacturing.
- Create an electro-mechanical device using software tools based on a technical requirement.
- Generate reports using communication software on the status of a technical project.

Note to Instructors

- This course and its grades will be structured around various homework assignments and quizzes, at least two oral presentations, a final exam, and one group project.
- A broad overview, comprehensive final exam will be given, which must be at least 10% of the final course grade.
- For the course project that requires programming, the programming language does not matter.

VWCC AND DISCIPLINE SPECIFIC OUTCOMES

- Same as above.

VCCS TOPICAL DESCRIPTIONS

- Industry Software Tools
 - Computer Aided Design Basics, Types of CAD, Vendors
- Product Development
 - Technical Specifications, Key Development Milestones, Product Compliance, Applying Software in Product Development.
- Cloud-based Data Storage
 - Basics of File Sharing
- Word Processing
 - Internet and Database Research, Word Processing Basics, Citing Sources
- Data Analysis
 - Data Basics, Data Collection, Software Analysis, Professional Tables and Charts
- Slide Decks
 - Slide Design
- Email
 - Email Construction
- Computer-Aided-Design in Mechanics
 - Basics of Mechanics, Measurements, 2D and 3D Drawings, Simulations.
- CAD in Electronics
 - Basics of Electronics, Measurements, Simulations.
- Coding in a Microcomputer
 - Hardware and Coding Basics, Software Driven Hardware Operation.
- Software Driven Manufacturing
 - 3D Printing Basics, CAD-Computer Aided Machining Basics
- Hardware Construction
 - Tools, Fasteners, Basic Construction Techniques
- Software Reporting
 - Technical Report Writing, Effective Presentations, Professional Emails

VWCC AND DISCIPLINE SPECIFIC TOPICAL DESCRIPTIONS

- Same as above.

[TITLE IX STATEMENT](#)

[ADA STATEMENT](#)