Miami Dade College

Course Description
EGN2200| Computer Applications in Engineering | 3.00 credits
An introduction to fundamental concepts and skills of mathematical programming and computer-aided design. This course explores the use of computer software to solve engineering problems and bring ideas from a concept to a model. Pre/ Co-requisite MAC1114 or MAC1147.

Course Competencies
Competency 1: The student will demonstrate knowledge of computational tools in engineering by:
1. Differentiating between an analytic and an algorithmic solution
2. Identifying the essentials of algorithmic development and pseudocode
3. Understanding the basic difference between programming tools and spreadsheet tools
4. Differentiating between accuracy and precision and the implication of both in engineering

Competency 2: The student will demonstrate knowledge of basic features of computational software by:
1. Analyzing the workspace and default interface
2. Identifying the terminology associated with the computational environment
3. Executing computations using software in the interactive mode
4. Differentiating between scripts and functions
5. Developing and using function and script files

Competency 3: The student will demonstrate an understanding of arrays by:
1. Examining how to control the flow of program steps
2. Demonstrating how to add logical branching steps to programs
3. Demonstrating the use of complex numbers
4. Solving a system of linear equations
5. Solving mathematical problems using arrays and matrices

Competency 4: The student will demonstrate an understanding of plotting functions using software such as MATLAB by:
1. Differentiating the types of plots including 2D and 3D used in engineering reports
2. Illustrating curve fit data
3. Creating simple Graphical User Interfaces (GUIs)

Competency 5: The student will understand the procedures of using the interface by:
Starting and exiting the program.
1. Searching for a file or folder
2. Demonstrating ability to open, save, & copy a file
3. Resizing working windows. 5. Creating sketches utilizing modeling techniques for non-orthogonal parts
4. Using windows and toolbars to start a drawing

Competency 6: The student will understand the basic functionality of Computer Aided Drawing software by:
1. Creating a new part document & 2-D sketch views of a solid model
2. Applying & Editing Dimensions on the object following design intent
3. Describing the characteristics of extruding base features & sketch
4. Demonstrate the Bottom-up technique for standard components
5. Demonstrate understanding of the Top-down assembly design method
6. Creating desired Drawing views to document design procedures
7. Performing Analyses on the computer model & refining the design as needed

Updated: Fall 2025

Competency 7: The student will understand the use of the standard toolbox parts and design library in assemblies by:
1. Defining parts of an assembly in a directory
2. Modifying toolbox part definitions to customize standard toolbox parts
3. Applying library features from design library
4. Using the smart components feature for reusing data of parts and assemblies.
5. Verifying that toolbox and toolbox browser are set up & running
6. Inserting additional components

Competency 8: The student will demonstrate knowledge of parts and assemblies by:
1. Applying basic drawing concepts to assembly parts
2. Creating detailed drawing of parts and assemblies
3. Using Dim Xpert information in drawings
4. Applying orthographic projection principles to layout of drawing
5. Creating section, detail and auxiliary views
6. Discussing problems created by using assembly parts
7. Integrating Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM)

Competency 9: The student will demonstrate knowledge of drafting by:
1. Generating various drawing views
2. Demonstrating knowledge of angles of projection
3. Demonstrating knowledge of how to create dimensions
4. Demonstrating a knowledge of how to insert annotations in drawings

Competency 10: The student will demonstrate knowledge of product data management by:
1. Demonstrating the ability to create new projects
2. Demonstrating the ability to attach external files and documents to drawings
3. Creating project archives and adding standard libraries to a vault

Learning Outcomes:
- Use quantitative analytical skills to evaluate and process numerical data
- Use computer and emerging technologies effectively
- Demonstrate an appreciation for aesthetics and creative activities