Program Title: **Engineering Technology**
Specialization Tract: **Computer-Aided Design and Drafting**

Specialization Concepts and Content: The purpose of this certificate is to prepare students for initial employment with an occupational title as computer aided design (CAD) specialists, CAD designers, architectural, civil, or mechanical drafters, technicians, or detailers in various specialized areas of industry that use digital design and modeling, or to provide supplemental training for persons previously or currently employed in these occupations. This certificate provides courses in CAD and solid modeling needed to assist the engineering activities of industry and consultants in planning, designing, and detailing.

VI. INTENDED OUTCOMES: After successfully completing this program, the student will be able to perform the following:

12.0 Demonstrate proficiency in advanced CAD commands.
13.0 Demonstrate proficiency in three-dimensional (3-D) drawings.
14.0 Demonstrate knowledge of using solid modeling software.
16.0 Demonstrate proficiency in digital modeling fundamentals.

Florida Department of Education

Student Performance Standards

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12.0 DEMONSTRATE PROFICIENCY IN ADVANCED CAD COMMANDS --The student will be able to:

12.01 Select the correct command for specified 2 dimensional tasks.
12.02 Develop the attributes needed for generic information for specific drawing types.
12.03 Demonstrate proficiency in various CAD plotting and printing options.
12.04 Create the plots of selected parts or drawings.
12.05 Develop the attributes needed for generic information for specific drawings.
12.06 Implement existing CAD library files for new drawings.
12.07 Develop appropriate new library files when necessary.
12.08 Demonstrate model space and paper space commands.
12.09 Draw plot, floor, electrical and foundation plans.
17.10 Apply standard dimensioning rules.

13.0 DEMONSTRATE PROFICIENCY IN THREE-DIMENSIONAL (3-D) DRAWINGS --The student will be able to:

13.01 Implement the CAD commands for three-dimensional drawings.
13.02 Implement and apply the CAD three-dimensional coordinate system for three-dimensional objects.
13.03 Use CAD three-dimensional surface commands for 3-dimensional objects.
13.04 Implement and apply basic software utilities for arranging, detailing, and plotting views of an object.
13.06 Create basic building construction, architectural and object designs in three dimensions.
13.07 Align, rotate, and mirror three-dimensional objects.
13.08 Render a three-dimensional model.
13.09 Customize screen, toolbars, and pull down menus.

14.0 DEMONSTRATE KNOWLEDGE OF USING SOLID (3-D) MODELING SOFTWARE -- The student will be able to:

14.01 Create a new part document and 2-D sketch views of a solid object.
14.02 Apply and edit dimensions on an object.
14.03 Create the standard drawing views to document the design procedures.
14.04 Perform analyses on the computer model and refine the design.
14.05 Measure and calculate properties of parts.
14.09 Enter and save data for an object drawing.
14.07 Create an assembly drawing.
14.08 Define parts of an assembly in a directory.
14.09 Apply basic solid modeling commands.
14.10 Apply orthographic projection principles to drawing's layouts
14.11 Plot solid modeling drawings.

16.0 DEMONSTRATE PROFICIENCY IN DIGITAL MODELING FUNDAMENTALS --The student will be able to:

16.01 Convert multiple sketches into extruded features.
16.02 Create the desired sketch to document the design procedures.
16.03 Perform analyses on the sketch procedures and refine the sketch design.
16.04 Create multiple parts using components of a design tree.
16.05 Perform advanced mating using multiple parts or sub-assemblies.
16.06 Define the type of analysis of machine elements of a part.
16.07 Combine 11-13 Perform and interpret finite element analysis on modeled objects.
16.08 Apply basic drawing concepts to molded parts.
16.09 Create detailed molds or die cavities of parts and assemblies.
16.10 Derive component parts from an edited mold base.
16.11 Choose and apply a type of material to use to render parts.
16.12 Create and insert render parts into the sheet environment of a solid modeling drawing.
16.13 Fabricate a part or an assembly using a rapid prototype machine.