Course Learning Outcomes:
By the end of this course, a student should be able to:

- Demonstrate knowledge of orthographic projection and the relationship of the six principle orthographic views
- Create detail sketches and drawings from assembly drawings and engineering sketches
- Create tabulated detail drawings
- Demonstrate the use of solid modeling software to set the environment and create templates for creating 3-dimensional parts in inch and metric-based systems
- Identify the relationship between multiple axes and planes in relationship to a given datum location in CAD software
- generate 3-dimensional solid model parts with parametric dimensions and geometric constraints
- generate solid modeling assemblies with dimensional and geometric constraints
- generate basic shop drawings from solid modeling parts and assemblies
- manipulate 2 and 3-dimensional computer parts, assemblies, and drawings in parametric software

Course Outline:

I. Basis for Solid Modeling Parts
   a. Orthographic Projection
   b. CAD Software Environment (Inch, Metric, Units, etc.)
   c. Reference features: Origin, Planes and Axes

II. Solid Modeling Parts
   a. Sketches, Parametric and Geometric Constraints
   b. Extruded and Revolved Solids
   c. Extruded and Revolved Cuts
   d. Added Features (Fillets, Holes, Webs, etc.)
   e. Modifications (Shell, Mirror, etc.)

III. Solid Model Assemblies
   a. Setting the Assembly Environment
   b. Dimensional and Geometric Constraints Between the Origin and Reference Planes
   c. Dimensional and Geometric Constraints Between Mating Parts
   d. Manipulating Constraints to Allow Motion in Desired Axes

IV. Shop Drawings of Solid Model Parts/Assemblies
   a. Setting the Drawing Environment
   b. Basic Title Block & Border
   c. Locating Multiple Viewports for Orthographic and Pictorial Views
   d. Basic Manipulation of Multiple Views (Hidden Lines, Shading, etc.)

V. Details Drawings
   a. Create Detail Drawings from Assembly Drawings
   b. Create Tabulated Detail Drawings