Course Objectives/Course Outline
Spokane Community College

Course Title: CAD Solid Modeling/Graphics 1
Prefix and Course Number: CAD 142

Course Learning Outcomes:

By the end of this course, a student should:

- Demonstrate the use of solid modeling software to set the environment and create templates for creating 3-dimensional parts, Drawings, and Assemblies in inch and metric-based systems
- Generate 3-dimensional solid model parts with parametric dimensions, geometric constraints, added relationships between multiple axes, planes, and datum locations in CAD software
- Generate basic shop drawings from solid modeling parts and assemblies including standardized part numbers, Bill of Materials, notes and tolerances
- Generate solid modeled lofts, sweeps, and full design project drawing sets
- Create tabulated detail drawings, and parts designed with patterns, tables, and equations
- Demonstrate knowledge and application for standard inch and metric threaded parts and fasteners

Course Outline:

I. Basis for Solid Modeling Parts
   A. CAD Software Environment (Inch, Metric, Units, etc.) and Templates
   B. 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 and Templates
   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 assemblies

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 lofts, sweeps, patterns, tables, and equations to drive part designs
   B. Create Tabulated Detail Drawings
   C. Callouts, drawing techniques for threaded parts and fasteners