

## Course Objectives/Course Outline Spokane Community College

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**Course Title:** CAD Solid Modeling/Graphics 1

**Prefix and Course Number:** CAD 142

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### 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 (Fillet, 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