

**Course Objectives/Course Outline**  
**Spokane Community College**

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**Course Title:** CAD Solid Modeling/Graphics 1  
**Prefix and Course Number:** CAD 241

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**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 (Fillet, 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