

## Engineering Design - HS/ Part A

**COURSE DESCRIPTION:** Computer-aided design systems are used by designers and manufacturers in virtually every industry to create engineering design solutions. In this course, students are introduced to engineering, learning the basics of CAD software: creating points, lines, other geometric forms, isometric drawings, and 3D models. They learn how to translate initial concepts into functional designs and 3D walkthroughs and explore career options in this hands-on introductory-level course.

**PREREQUISITES:** None

**COURSE LENGTH:** One Semester

**REQUIRED TEXT:** No required textbook for this course.

**MATERIALS LIST:** Software: Free download provided in course

System Requirements:

Microsoft Windows XP or Windows Vista operating system; 600 MHz or faster processor (1 GHz for Vista); 512 MB of memory (RAM) (1 GB for Vista); at least 2 GB of available hard drive space; 3D class video card with 128 MB of memory or higher (256 MB for Vista), the video card driver must support OpenGL version 1.5 or higher

NOTE: List subject to change.

### COURSE OUTLINE:

#### Unit 1: Course Overview

- Start the Course
- Set Up Your Computer
- Set Up a Browser and Install 7-Zip
- Find and Complete Coursework
- Health and Safety in the Workplace
- Computer Basics

#### Unit 2: Project 1: Create Shapes

- Explore CAD
- Set Up a Drawing
- Use Coordinates
- Create a House

**Unit 3: Project 2: Create Orthographic Drawings**

- Explore Orthographic Projections
- Draw a Front View
- Draw Two Views
- Draw a Three-View Orthographic Drawing
- Draw a Hole

**Unit 4: Project 3: Draw Sectional Views**

- Explore Sectional Views
- Draw a Sectional View
- Place Cutting Planes

**Unit 5: Project 4: Create an Isometric Drawing**

- Explore Pictorial Drawings
- Draw with Angles

**Unit 6: Project 5: Create an Oblique Drawing**

- Explore Oblique Drawings
- Draw with Oblique Angles

**Unit 7: Project 6: Create a Perspective Drawing**

- Explore Perspective Drawings
- Draw in Two-Point Perspective

**Unit 8: Project 7: Draw an Auxiliary View**

- Explore Auxiliary Views
- Draw with a Reference Plane

**Unit 9: Project 8: Dimension Drawings**

- Dimension a Block
- Use Baseline Dimensioning
- Dimension a Circle
- Explore Complex Dimensioning

**Unit 10: Project 9: Create Working Drawings**

- Explore Working Drawings
- Draw a Title Block
- Draw a Detail Drawing
- Create a Bill of Materials
- Export Working Drawings

**Unit 11: Project 10: Create a 3-D Design**

- Explore 3-D Space
- Draw Edges and Surfaces
- Create a House
- Add Objects to the Yard
- View Your Design and Reduce File Size

**Unit 12: Project 11: Exploring Design**

- The Design Process
- Designing for People and the Environment