Parts of a CAD System

- CPU
- Input
- Output
- Operating System
- Software
CPU

Central Processing Unit receives data and manages and controls the functions of the CAD system.

It is analagous to a human’s brain, which interprets data and controls motor functions.
Input Devices

- Mouse
- Digitizer
- Trackball
- Light Pen
- Touch Screen
- Keyboard
- Voice
Output Devices

- Monitors
- Printers
- Plotters
- Rapid Prototyping
Storage Devices

- Fixed disk drive or hard drive (2-9 GB common)
- Floppy disk drive (1.44 MB)
- Zip drives (100 MB)
- CD-ROM drives (800 MB)
- Optical drives (1 GB)
- Magnetic tape (1+ GB)
An operating system is a set of instructions that control the operation of the computer and its peripheral devices.

Operating systems control the execution of specific program.

Operating systems provide support for activities like input and output (I/O)

Examples: Windows 95/NT 4.0, UNIX, OS2
CAD Software

Common basic features:

- Commands to generate geometry
- Functions for controlling views
- Modifiers for changing drawing geometry

Select a system that will meet your needs.
Summary

- CAD Systems are made up of computer hardware and specialized software.
- The use of CAD has revolutionized engineering graphics.
- Usually you should select the software that will perform the functions you require and then select hardware appropriate to run that software effectively.
Geometric Construction & Modeling Basics
Points

- A point represents a location in space or on a drawing. It has no width, height or depth.
- Sketch points by a short crossbar on a line, or by a small cross.

(a)  (b)  (c)
Lines

- A straight line is the shortest distance between two points.
- Parallel lines
- Intersecting lines
- Perpendicular lines
Polygons

- A polygon is any plane figure bounded by straight lines.

A Pentagon
Regular Polygons

- Regular polygons have equal angles and equal sides.
- They are often created and described by inscribing them in a circle, or circumscribing them about a circle.
- Hex head bolts are a typical example
Circles

- A circle is a closed curve, all points of which are equally distant from the center.
- Circumference equals pi times the diameter
  \[ C = \pi d \]
**Extruded Solid**

- CAD construction for a 3D part having a uniform cross section.
- Named for the manufacturing process of forming material by forcing it through a shaped opening.
Revolved Solid

- construction by revolving a uniform cross-section along a circular path.
Boolean Operators

- Venn diagrams can be used to show Boolean operations.
- Union (addition)
- Difference (subtraction)
- Intersection
Boolean Operations of Solids

Results of Boolean operators on solids

\[ A \cup B \]
(A union B)

\[ A - B \]
(A subtract B)

\[ A \cap B \]
(A intersect B)
Summary

- Points, lines, and circles are the basic geometric elements used to make 2D sketches.
- Using CAD you can create 3D models.
- Understanding geometric solids can help you create CAD models and interpret and visualize from 2D sketches and drawings.