Freshmen Engineering 110

SolidWorks 2000®

First Lesson
Fundamental features of Solid Modeling

1. Parts are designed as solids, ie 3-D
Fundamental features of Solid Modeling

2. SolidWorks is a dimension-driven system
Fundamental features of Solid Modeling

3. A SolidWorks 3D model consists of parts, assemblies, and 2-D drawings

Part Model
Assembly

• Assembly Model
Drawings

• 3. Orthogonal Views
Other Features

• Sectional View:
Other Features

- Measure any dimension:
Other Features

- Material Properties:

![Image of mass properties window]

- Density: 0.00 grams per cubic millimeter
- Mass: 275.07 grams
- Volume: 99662.43 cubic millimeters
- Surface area: 100958.06 square millimeters

Center of mass (millimeters):
- X = 60.00
- Y = 60.00
- Z = 37.00

Principal axes of inertia and principal moments of inertia (grams² * square millimeters):
- \( I_x = 503119.52 \)
- \( I_y = 503119.52 \)
- \( I_z = 787533.42 \)

Moments of inertia (grams * square millimeters):

- Taken at the center of mass and aligned with the output coordinate system:
  - \( I_{xx} = 503119.52 \)
  - \( I_{yy} = 503119.52 \)
  - \( I_{zz} = 787533.42 \)

- Taken at the output coordinate system:
  - \( I_{xx} = 1983953.13 \)
  - \( I_{yy} = 1983953.13 \)
  - \( I_{zz} = 270025.24 \)
Useful Keys

- “F” key to fit design to window
- “Z” key to zoom out
- Shift “Z” key to zoom in
- Ctrl “Z” key to cancel last command
- “ESC” key to disable latest operation mode
- “Space Bar” to select different views
First Practice

• **Bring Up SolidWorks**
  Start ➔ Programs ➔ SolidWorks 2000

• **Display Tool Bars**
  View ➔ Toolbars ➔ Should see Standard, View, Features, and Sketch

• **Create a New Part Document**
  New button then click *Copy of Part*

• **Check Option Settings**
  Tools ➔ Options
  Document Properties:
  Detailing ➔ Annotations Display ➔ Always display at the same size
  Grid/Snap ➔ No Grid display, No Snap display
  Units ➔ Linear units: mm
First Practice

Objective is to create this part

1. Create a New Part
   Click (New) then click *Copy of Part*

2. Check Options (as before)

3. Open a sketch
   Click
   Build Base-Extrude 120x120x50 mm high
First Practice

4. Open a sketch then build Boss-Extrude1
   70 mm dia x 25 mm high
5. Open a sketch then build Cut-Extrude1
   50 mm dia then extrude cut through all
6. Shell part
   Select surface then click shell icon, 2mm thick
6. Add fillet1 to 4 corners at 10 mm
7. Add fillet2 to 4 edges and base of Boss-Extrude1 at 5 mm
First Practice: Final Result