ENG 1102 Session 2
Graphics in Engineering

• Intro to I-DEAS

I-DEAS software

• Integrated Design Engineering Analysis Software (I-DEAS)
• Integrated means: You can within the same package:
  • model a part
  • create a drawing from it
  • analyze it
  • set up manufacturing tool paths
• Early development supported by NASA
• I-DEAS was written by SDRC (Structural Dynamics Research Company), now owned by Unigraphics.

Intro to I-DEAS - Objectives

• To learn I-DEAS basic screens
• To sketch simple shapes in I-DEAS
• To transform 2-D sketches into 3-D objects by extrusion
• To investigate some 3-D viewing options

Software Structure

• I-DEAS is organized into:
  • Applications: Design, Simulation, Drafting, Manufacturing, etc.
  • Tasks: subset of Applications
• Example: Design Application has 5 tasks:
  1. Master Modeler
  2. Master Assembly
  3. Master Drafting
  4. Mechanism Design
  5. Harness Design
ENG1102 IDEAS across Campus

- *ideas1102* created so students have ONE Library they can access in class and home dept.
- All you have to do:
  - Log in ⇒ Open an Xterm ⇒ Type "ideas"

NOTE: *ideas1102* will be up across campus by Sept. 2

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I-DEAS Start-up

- Project (your userid)
- Not needed
- Application & Task

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I-DEAS Screen Layout

- Workplane
- Menu Bar
- Task Icons
- Application Icons
- All I-DEAS Icons
- Graphics Region
- List Region
- Prompt Region

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2-D Sketching Icons

- Each Geometric entity has several creation methods
  - Circles:
    - 3 pts
    - Center-Raduis
    - etc.
  - Polylines, Lines, Rectangles
  - Arcs
  - Splines, Ellipses
  - 2-D Fillets & Chamfers
Extrusion

- Materials processing term:
  - material is forced through a die of a given shape resulting in an object of constant cross-section
- Example:
  - Forming complex cross-sections in steel rods is done by applying pressure to molten steel and forcing it through a die (i.e. Play-Dough Fun-Factor)

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Extrusion Used to create 3-D parts from 2-D shapes
- Extrusion in Computer Aided Design:
  1) A 2-D shape is drawn
  2) It is “copied” a given distance away
  3) Lines are drawn connecting the original with the copy

Part Extrusion in I-DEAS
1. Draw the 2-D shape for extrusion
2. Click the Extrude Icon
   - Select the 2-D geometry for Extrusion
3. Read the prompt (Click center mouse button for “done”)
4. Set the extrude values in the form.
5. Click the “eyeballs” to preview the part.
6. Click OK to create part.

Viewing Options in I-DEAS
(lower third of icon panel)
- Redisplay
- Line View
- Shaded Surfaces
- Top
- Isometric
- Front
- Side
Extruding Parts with Holes

- You can create a part with a hole as you extrude
- I-DEAS assumes that the inner shapes are holes

Procedure for Extruding Parts with Holes

1. After creating the 2-D shape with holes, click Extrude
2. Select the outer shape as the section for extrusion
3. At the prompt, select one of the inner sections (Shift-Left Click to select inner sections)
4. Pick the sections until you are done
5. Press Return to get the Extrude Form
6. Proceed as before

Dynamic Viewing in I-DEAS

- Change your viewpoint in real time in I-DEAS
- Hold down one of the function keys and move the mouse
  - F1 Pan
  - F2 Zoom
  - F3 Rotate
  - F5 Restores the view to original

As a Group...(switch drivers)

- Delete your current part from the screen and switch to a front view
- Sketch the shape shown below and extrude to form a part with holes in it
- Experiment with dynamic viewing in I-DEAS
I-DEAS Tutorials

- In I-DEAS, go to Help ⇒ Help Library ⇒ Under Training/Support, click on: Tutorials
  - Creates a link to the Tutorial Home Page
- Go to Design, Part Modeling, Click on: 1. Fundamentals
- Reading for next class (Thurs, Aug 28):
  1. Introducing I-DEAS Interface