Pro/E Review

MAE 205
Capturing the Design Intent (cont.)

Creating 2-D Sketch Features

- Create the Sketch
  - References
  - Centerlines
  - Lines, Circles, Rectangles, Arches
- Dimension the Sketch
  - Weak dimensions
  - Strong dimensions
Creating Extruded Features

Creating Extruded Features from 2-D Sketch Features

- Extrude sketches perpendicular to the sketching plane.
  - Specify a depth and direction.
- Create protrusions or cuts.
  - Add or remove material from the model.
Editing
Selecting Features, Geometry, and Components

Select features, geometry, or components to make modifications to the selected items.

**Selection Methods:**
- Direct Selection
- Query Selection
- Search Tool

**Direct Selection:**
- On the model
- Using the model tree

**Deselect:**
- CTRL + select again
- Select on Graphics Window
- Edit > Select > Deselect All
Selecting Features, Geometry, and Components (cont.)

Query selection enables selection of features, geometry, or components that are hidden beneath another item.

Query Selection:
- Select by querying the model.
- Select using the query list.
Selecting Features, Geometry, and Components (cont.)

Search by various methods and then select items.
Selecting Features, Geometry, and Components (cont.)

**Smart Filter**
- The selection of features, geometry, or components is a nested process.
- Select specific items of interest after the initial selection.

**Smart Filter Selection Levels**
- Feature / Component level
- Geometry level (Surfaces, Edges, or Vertices)
Controlling Component/Feature Display and Regeneration

Suppress/Resume

- Suppress removes features or components from the graphics display and from the regeneration cycle simultaneously.
  - *Suppressing a parent will suppress children by default.*
- Resume restores suppressed items.

![Original Model](image1)
![Component Suppressed](image2)
![Original Model](image3)
![Holes Suppressed](image4)
Editing Design Models

Edit: Edit dimensions of a selected feature or component.
- Editing by entering a value.
- Editing with the Most Recently Used option.

Regenerate to update the model

Undo / Redo capability
Editing Design Models (cont.)

Edit Definition: Change feature type, size, shape, location, references, or options.

Edit Definition using:
- Dashboard
- Drag handles
- Context sensitive right mouse button options

Drag Handles

Dashboard
Parent/Child Relationships – Editing Design Models

When editing design models, consider the parent/child relationships that already exist. Changes made to a parent feature affects its children.

- **Edit**
  - *Children of feature or component update as edits are regenerated.*

- **Edit Definition**
  - *Enables you to change the parent of the feature or component.*
  - *Changes are automatically regenerated upon completing the feature definition.*

- **Suppress/Resume**
  - *Enables you to remove a feature or component and their children from the graphics window and the regeneration cycle.*

- **Delete**
  - *Deletes all children of the selected feature or component by default.*

- **Hide/Unhide**
  - *Does not affect parent/child relationships.*
Holes
Creating Holes

Hole Types

- Straight Hole
- Standard Hole
  - ISO
  - UNC
  - UNF
Creating Holes (cont.)

**Linear Placement**
- Primary References
  - *Surface or Datum Plane*
- Secondary References
  - *2 Surfaces or Datum Planes*

**Coaxial Placement**
- Primary References
  - *Datum Axis*
- Secondary References
  - *Surface or Datum Plane*
Creating Holes (cont.)

Radial Placement - Planar Surface

- Primary References
  - *Surface or Datum Plane*
- Secondary References
  - *Datum Axis*
  - *Surface or Datum Plane for Angle*
Creating Holes (cont.)

Radial Placement - Cylindrical Surface

- Primary References
  - Surface

- Secondary References
  - Surface or Datum Plane for Offset
  - Surface or Datum Plane for Angle
Creating Holes (cont.)

Depth Options
- Variable (Blind)
- To Next
- To Selected
- Through All
Rounds
Creating Rounds

Edge Rounds
- References
  - Edge(s)
Creating Rounds (cont.)

Surface-Edge Rounds

- References
  - A Surface and an Edge
Creating Rounds (cont.)

Full Rounds

- References
  - 2 Edges
  - or
  - 2 Surfaces and a 3rd Surface to remove
Creating Rounds (cont.)

Surface-Surface Rounds

- References
  - 2 Surfaces
Chamfers
Creating Chamfers

Chamfers

- References
  - Edge(s)
  - Surface and Edge
  - 2 Surfaces

- Types:
  - D x D
  - D1 x D2
  - ANG x D
  - 45 x D
  - O x O
  - O1 x O2

Ang x D and 45 x D

D x D and D1 x D2
Creating Drafts

Drafts

- Types
  - Many variations depending on selection of Draft Surfaces, Neutral Object, Hinge Object, optional Split Object
  - Angle +/- 30°

- References
  - Surfaces, Planes, Curves

- Single Surface
  - Hinge = TOP
  - Split = TOP

- Single Surface
  - Hinge = TOP

- Single Surface
  - Hinge = Top Surface

- Loop Surfaces
  - Hinge = TOP
Shells
Creating Shells

Shells

- Types
  - Single Surface
  - Multiple Surfaces
  - Multiple Thickness Values
Datums
Creating Datum Planes

Datum Planes

- Types
  - Through
  - Offset
  - Parallel
  - Normal
  - Tangent

- References
  - Datum Planes
  - Datum Axes
  - Datum Points
  - Edges
  - Vertices
  - Surfaces

- Example use
  - Select as reference for draft hinge
Creating Datum Axes

Datum Axes

- Types
  - Through
  - Normal
  - Tangent
- References
  - Datum Planes
  - Datum Points
  - Edges
  - Surfaces
  - Vertices
- Example use
  - Select as reference for coaxial hole
Revolved Sections & Ribs
Concepts

Concepts: Capturing Design Intent with Sketcher

- Capturing design intent in Sketcher
  - Constraining sketches
- Extruding and revolving sketched features
  - Thicken Sketch Option
- Creating ribbed features
Creating Sketch-based Features (cont.)

Creating Revolved Features from 2-D Sketches

- Revolve a section about a sketched centerline.
  - Requires a sketched centerline or selected reference as the axis of revolution.
  - Specify an angular value (depth) and direction.

- Create protrusions or cuts.
  - Add or remove material from the model.
  - Thicken Sketch option.
Creating Sketch-based Features (cont.)

Creating Ribbed Features from 2-D Sketches

- Extrude a sketch into a rib feature.
  - Ribbed features use an open section sketch.
  - Similar to extruded protrusions.
  - Material can be added on either side or symmetric about the sketch.