Lesson 1 – Basics, Systems and Components

Building Information Modeling (BIM)
- Parametric 3D Model
- Traditional “drawings” (plans, sections, etc…) are views of the model

File Types:
- Models (Projects) – **RVT** (template = RTE)
  - Default Templates = Construction, **Architectural**, Structural, Mechanical
  - “Browse” to choose additional templates
- Families - **RFA** (template = RFT), "Symbols"
  - Choose templates that match geometry type (i.e. door, window, etc…)

Layout
- Workspace - Elevation Markers (movable). "View Control Bar"
- File Menu - Files (Open, Save, Print, etc...)
- Quick Access Toolbar - Frequently accessed tools. Customizable.
- Tabs/Ribbon – “Architecture”, “Structure”, “Systems” (MEP), “Annotate”, etc..
  - + Contextual Panels – Modify + Tools based on selection (Draw, etc…)
  - + Options Bar – Settings specific to command (i.e. Wall Height, etc…)
- Properties - Display depends on what's selected ("nothing" = view properties)
- Project Browser – Views of 3D model (plans, elevations, etc…)
- “View/Windows/User Interface” – Panels, Keyboard Shortcuts (2-letters)

Snaps – (“Manage/Snaps”)
- Override – Suspends all, BUT entered snap:
  - Endpoints [SE]
  - Midpoints [SM]
  - Intersections [SI]
  - Others – Perpendicular [SP], etc…
- [SO] - Suspends ALL snaps for a single pick
- Length & Angular snap - Increments

Lesson 1 – Basics, Systems and Components (cont...)

Views – Default views depend on template. (Default template is a 1-story building)

- 3D (complete model)
  - "{3D}" = Orthographic. Working view
  - Others are cameras (Perspectives)

- Zoom, Pan – Mouse wheel
- Orbit - Shift-wheel

- "View Cube" – Views are not plans or elevations

- Plans ("horizontal sections")
  - Floor Plans - Level1, 2, etc…
  - Ceiling Plans - Level 1,2, etc…
  - Others ("View") – Structural, Floor, etc…

- Elevations – North, South, East and West. Others ("View/Elevation")

- Section ("vertical sections") - User defined, "View" tab
  - Placing – "Head" then "Tail"
  - Orientation, Crop Lines - controls view
  - View and drawing numbers filled in when placed on sheet

- Thin Lines [TL] – Toggles visibility of line thicknesses

- Callout – Enlarges portion of view.
  - Places new view in separate area of project browser
  - Can be used in any view. Plan, Elevation or Section

- Drafting View – Non-model (2D-only) view. Independent of model.

Workspace controls

- Detail Level
  - Coarse – Used for plans
  - Medium (or Fine) - Sections

- Visual Style – Determined by "type" settings
  - Wireframe & Hidden lines
  - Shading – Shaded & Consistent Colors
  - Rendered – Textures & Raytrace

Lesson 1 – Basics, Systems and Components (cont...)

Objects - "Lowes or Home Depot"
Systems - Walls, ceilings, curtain walls, etc…
Components - Windows, doors, etc…

SYSTEMS

Wall [WA] – Wall placed on current level

Family/Type - Generic, Brick, etc...

Create Method – "Draw" panel.
1 Draw (Line, Rectangle, Arc)
2 Pick Lines – typically Model Lines (construction line).
3 Pick Faces (massing)

Location Line – What is "drawn". Wall's location determined by setting:
WallCenterline, CoreCenterline, FinishFace, CoreFace, etc…

Chain/Offset

Height – Unconnected + Height or Level (1, 2, etc...)

Creating Levels [LL] – "Datum/Level"
Levels are created using vertical views (i.e. elevations or sections)

Typically need one more level than floors (i.e. roof plan)
"Draw" or "Pick Lines" – Offset is the better method

Check "Create Plan View" and "…Type" (Floor, Ceiling and/or Structural)

SYSTEMS (Sketch-Based)

Sketch Mode - Click "Finish" (Green Check) or "Cancel" (Red X)

Floor (Architectural) – Pick "Type", then Draw:
Pick Walls – ***"Hover + Tab** (cycles through selections) **+ Click"***
Line, Rectangle, etc… (or Pick Lines)
"Extend into wall (to core)" – Floor to finish face,int or ext. Core, int or ext.

Slab Edge – Structural edge for ground floor. Click edge. Try using 3D view.
Structural Floor – Additional internal parameters for use by engineers

Lesson 1 – Basics, Systems and Components (cont...)

Site – Toposolid “Massing & Site” tab. Replaces Toposurface since Revit 2024.
Sketch mode (or import)
“Add Point” + “Offset from surface” to change elevations from 0’-0”
“Reset Shape” to flatten

Ceiling – Only visible on Ceiling Plan (even if “drawn” on floor plan)
Choose type (i.e. 2’x4’ Acoustic Ceiling Tile)

Auto – Click in center. Revit seeks boundary (surrounding walls)
Sketch ceiling – Sketch Mode. Draw ceiling boundary

Slope - Draw arrow. Tail is peak, Head is base.
Set heights of each in property panel
Each slope is a separate ceiling

Roof – Will likely need one level (roof plan) more than floors

1. Roof by Footprint (default) – Sketch mode

Choose type (i.e. Generic, etc…) and Draw:
Pick Walls – Hover-Tab-Click
Line, Rectangle, etc…(or Pick Lines).

Overhang – Soffit

Defines Slope – By default, each edge defines a slope
Select to edge to remove slope – Hip, Gable, Flat

Edit Footprint (Profile) – Returns to sketch mode

Modify Wall - Attach/Detach wall to roof

Extents/View Range on “roof” level – Top, Cut Plane, Bottom + Offset

2. Roof by Extrusion – Draw an open line &/or arc in an elevation

3. Soffit – Activate roof’s level. Works best when roof edge is drawn on a level.
1. Use “Pick roof edges” to set boundary 1
2. Use “Pick Walls” to set boundary 2. Tab for all wall edges.

4. Fascia – Type driven

Lesson 1 – Basics, Systems and Components (cont...)

COMPONENTS

General Organization

Hierarchy
- Categories/Elements - Broad organization (i.e. Door or Window)
- Families - Like geometry (i.e. Single Door vs Double Door)
- Types/Class - Object with specific parameters (i.e. 3'-0" Single Door)
- Instances - Single object of a type, placed in project

Types (symbols)

Family files (RFA) – Loaded with template or from installed libraries

www.autodesk.com/revitcontent

Manufacturers – Download RFA from websites

Also “bimobject.com”

Model in place – Similar to massing

Clone - CTRL+drag

Door [DR] – Must be inserted in a wall

Choose “Type”, Load family (RFA) or Model in Place

To adjust position, drag or use temporary dimension line parameters
Move witness Line (Center/Jambs)

Can flip swing and/or jamb (arrows or space bar)

Window [WN] – Must be inserted in a wall

Choose “Type”, Load family (RFA) or Model in Place

To adjust position, drag or use temporary dimension line parameters
Move witness Line (Center/Jambs)

Can flip swing, if casement (arrows or space bar).

Lesson 1 – Basics, Systems and Components (cont...)

Columns [CL]

Structural - Wide Flange

Architectural – Rectangular, Load family (RFA) or Model in Place

Grid [GR] - “Datum/Grid”

"Draw" or “Pick Lines" (Use Offset)

Component [CM] – Everything else

Choose “Type”, Load family (RFA) or Model in Place

Site and Parking Components also in “Massing & Site” tab

RPC Trees - Raster/Vector hybrid. Realistic/Raytrace or Rendered only

“Insert” tab – To load non-component (and component) family files.

Model in Place – Option for components.

3D modeling tool

Similar to massing.

Must name the object and choose a family category (i.e. “Doors”)

“In-Place Editor” – Similar to sketch mode

Create:

1. Choose Forms (Extrusions, etc…) and Void forms (subtractions)
2. Draw profiles.
3. “Depth” = Height

Insert – Import vector file (DWG, 3DM, SKP, etc…)