Chapter 6: Create Surfaces from Curves

A common way of working in 3-D is to draw curves that represent edges, profiles, cross-sections, or other surface features and then to use surfacing commands to create surfaces from those curves.

Edge curves

You can create a surface from three or four curves that form the sides of the surface.

Create a surface from edge curves

1. Open the tutorial model EdgeSrf.3dm.
2. On the Surface menu, click Edge Curves.

️ Press F1 or open the Command Help panel to review the help topic for the EdgeSrf command.

3. Select the four curves.

Objects change to yellow when you select them.
A surface is created from the curves that form its edges.
Extrude curves

Extruding creates surfaces by tracing the path of a curve in a straight line.

Create an extruded surface

1. Open the tutorial model Extrude.3dm.
2. On the Surface menu, click Extrude Curve, and then click Straight.

3. Select the curve (1).

4. At the Extrusion distance prompt, drag a distance with your mouse and click.
Chapter 6: Create Surfaces from Curves
Loft curves

Lofting creates a smooth surface that blends between selected shape curves. This surface looks similar to the Sweep a curve with two rails example, but is created without rail curves. Instead, the edges of the surface are created by fitting smooth curves through the shape curves.

Create a lofted surface

1. Open the tutorial model Loft.3dm.
2. On the Surface menu, click Loft.

Press F1 or open the Command Help panel to review the help topic for the Loft command.

3. Select the three curves (1), (2), and (3), and press Enter.

4. In the Loft Options dialog box, click OK.

5. Try some of the Style options and then click Preview to see the various loft styles.
Revolve curves

Revolving a curve creates a surface by revolving a profile curve about an axis. This is sometimes called *lathing*.

Create a revolved surface

1. Open the tutorial model *Revolve.3dm*.
2. In the status bar, click Osnap.
3. In the Osnap dialog box, click End.
4. On the Surface menu, click Revolve.

5. Select the profile curve (1) and press Enter.

6. At the Start of revolve axis prompt, snap to one end of the axis line (2).
7. At the **End of revolve axis** prompt, snap to the other end of the axis line (3).

8. At the **Start angle...** prompt, select the **FullCircle** option.
Revolve curves with a rail

Rail revolve creates a surface by revolving a profile curve around an axis while at the same time following a rail curve. This is basically the same as **Sweep Along 2 Rails**, except one of the rails is a central point.

Create a revolved surface with a rail curve

1. Open the tutorial model **RailRev.3dm**.
2. On the **Surface** menu, click **Rail Revolve**.
3. **Select** the profile curve (1).
4. At the **Select rail curve...** prompt, select the rail curve the revolve will follow (2).
5. At the **Start of RailRevolve axis** prompt, snap to an endpoint of the axis line (3).

6. At the **End of RailRevolve axis** prompt, snap to the other end of the axis line (4).
Sweep along one rail curve

Sweeping creates a surface with cross sections that maintain the initial orientation of the shape curve(s) to the path curve.

Create a sweep surface

1. Open the tutorial model Sweep1.3dm.
2. On the Surface menu, click Sweep 1 Rail.

Press F1 or open the Command Help panel to review the help topic for the Sweep1 command.

3. Select the rail curve (1).

4. At the Select cross section curves ... prompt, select the cross-section curve (2), and press Enter.
5. In the **Sweep 1 Rail Options** dialog box, click **OK**.
Sweep along two rail curves

Using two rails for a sweep creates a smooth surface through two or more shape curves that follow two curve rails. The rails also affect the overall shape of the surface. Use this command when you want to control the location of the edges of the surface.

Create a sweep surface with two rail curves

1. Open the tutorial model sweep2.3dm.
2. On the Surface menu, click Sweep 2 Rail.

Press F1 or open the Command Help panel to review the help topic for the Sweep2 command.

3. Select the first rail curve (1).
4. At the Select second rail... prompt, select the second rail curve (2).

5. At the Select cross section curves prompt, select the two cross-section curves (3) and (4), and press Enter.
6. In the **Sweep 2 Rails Options** dialog box, click **OK**.