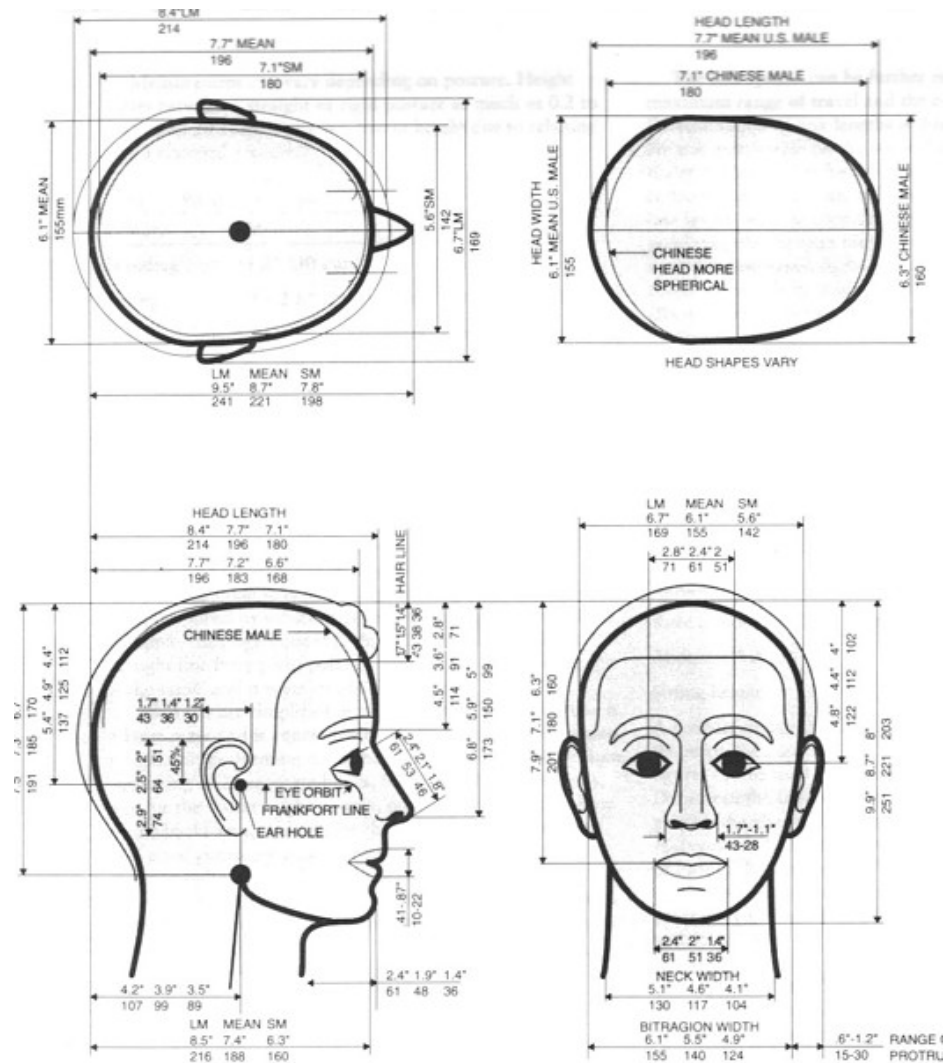


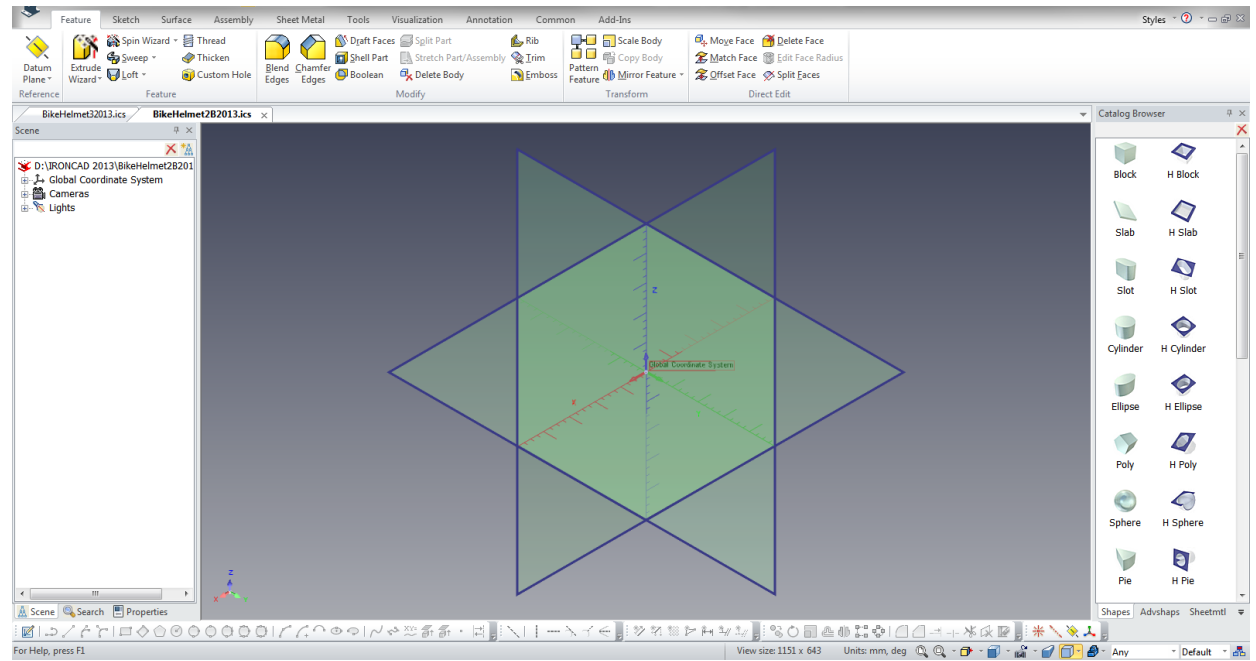
Step by step IC2013: bike helmet

This is a step by step exercise on how to model a bike helmet in IRONCAD

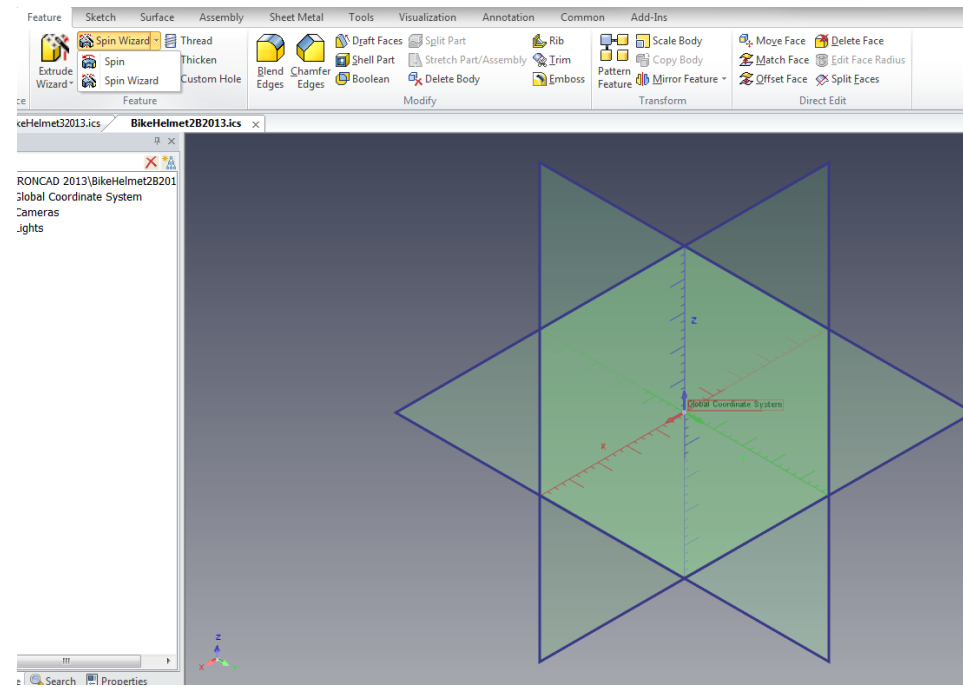
Let me begin by getting a reference from THE MEASURE OF MAN AND WOMAN: Human Factors in Design by Alvin R. Tilley Henry Dreyfuss Associates.



Create a scene by selecting metric tab and gray datum scene.



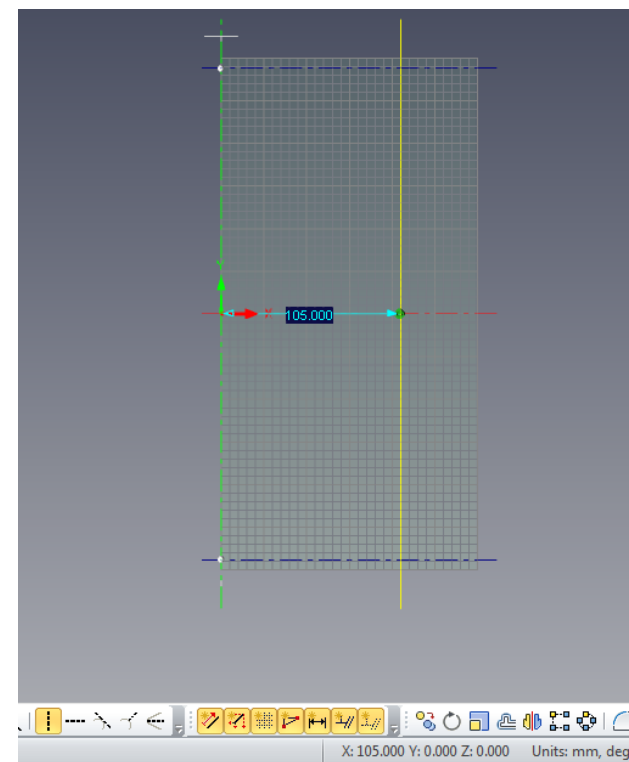
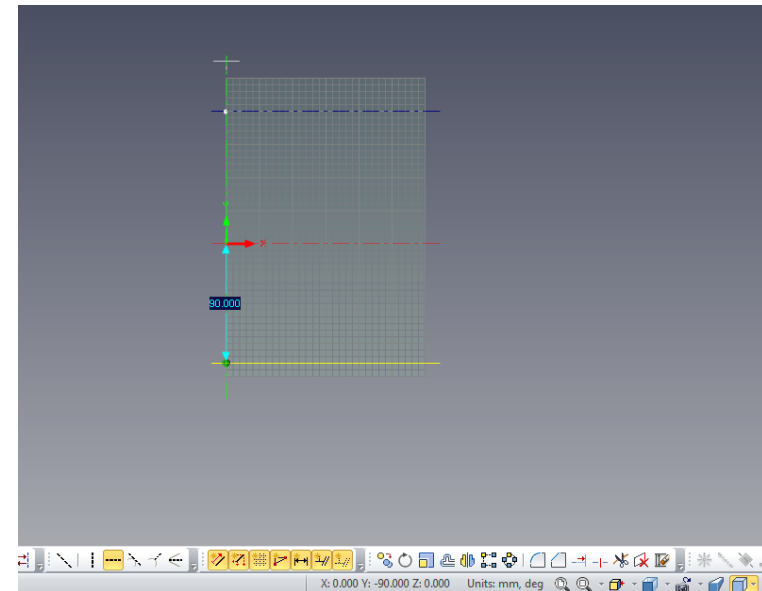
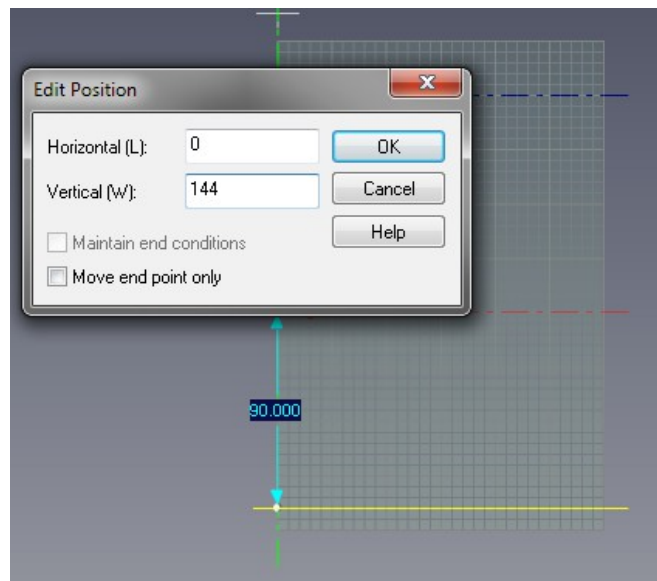
Select Spin Wizard from the Feature tab



Set the horizontal and vertical construction guides from the 2D Construction

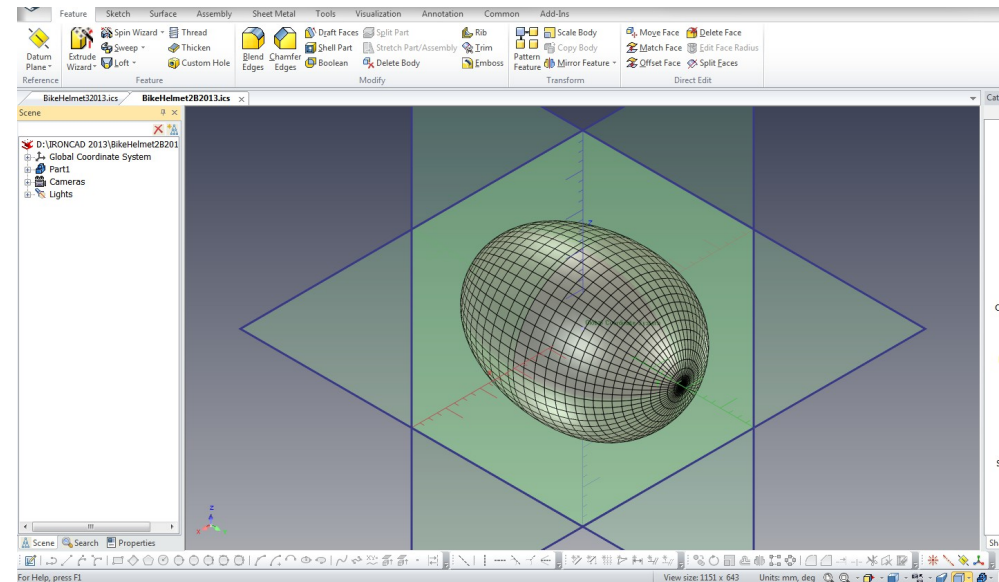
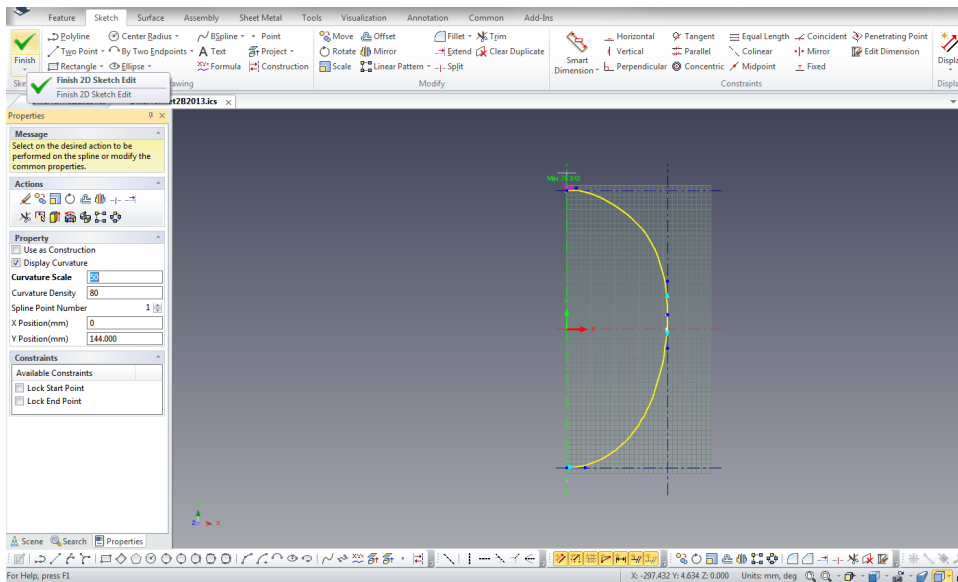
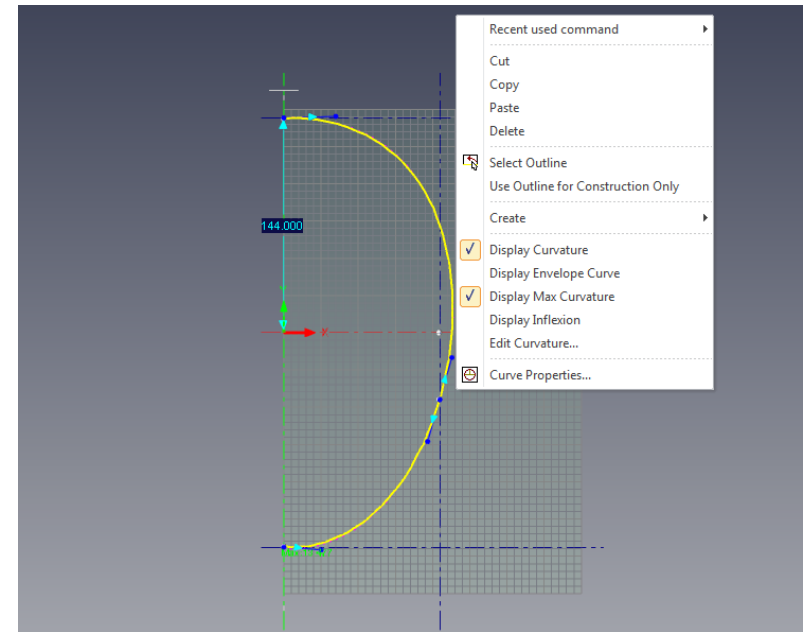
For this project, on View > Toolbars . Toolbars... > Customize window > Toolbars tab Tick from the list: 2D Construction, 2D Display, 2D Editing and 2D Technical Drawing to display.c Grid set to 25 mm for both main and 5 mm for both minor settings.

Set both top and bottom horizontal guides by editing the numerical readout to 144.000 from the center of the grid and 105 mm for the vertical construction guide to the right.



From the Sketch tab select B spline to draw.

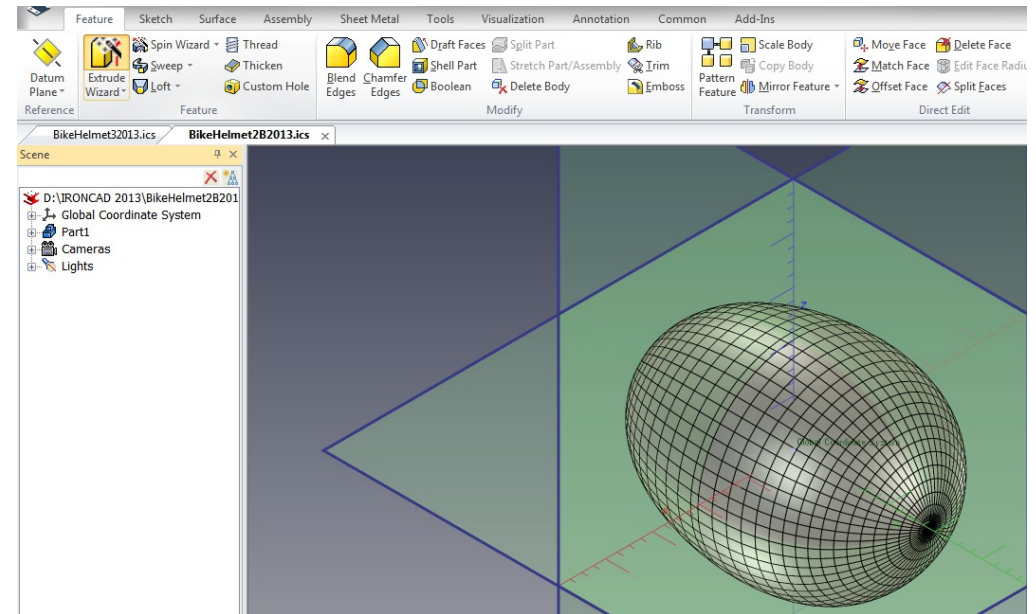
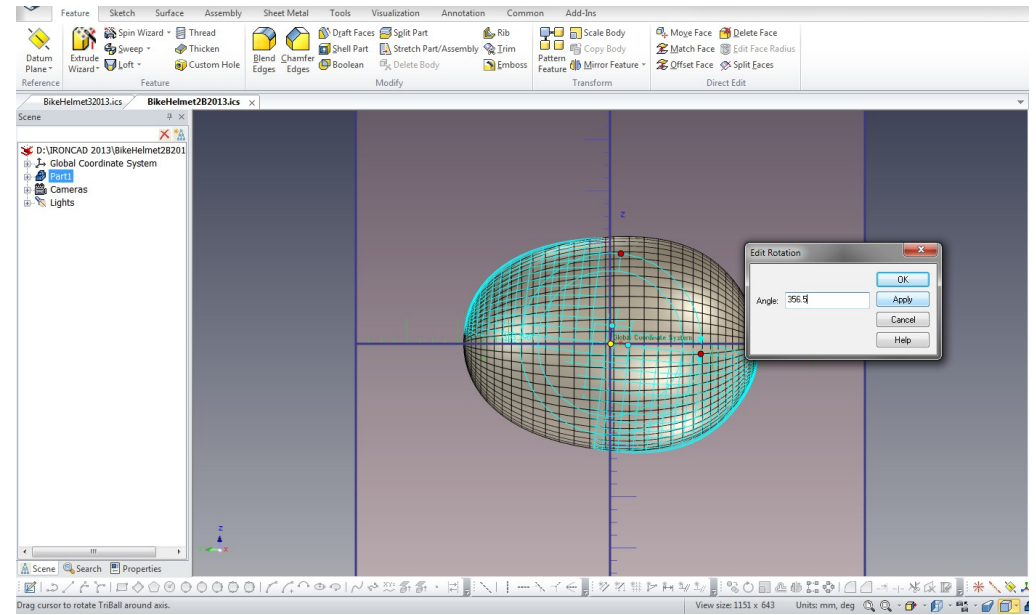
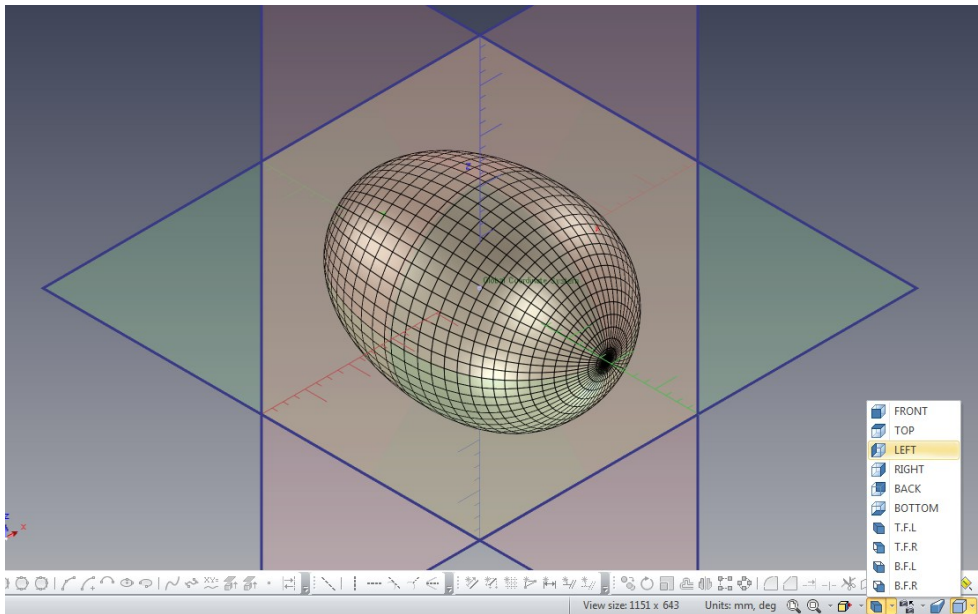
You may opt to activate Display Curvature and Display Max Curvature using the right click button on your mouse.



Finished Part1

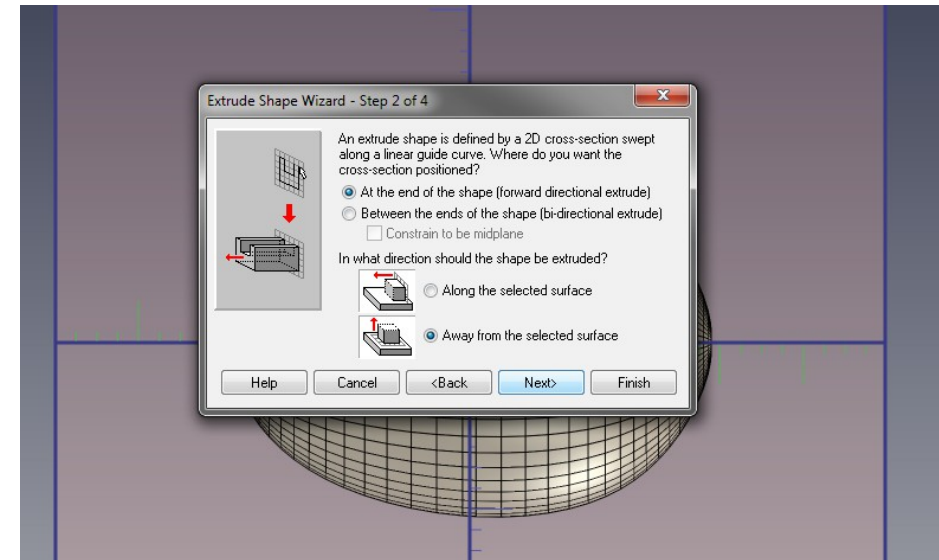
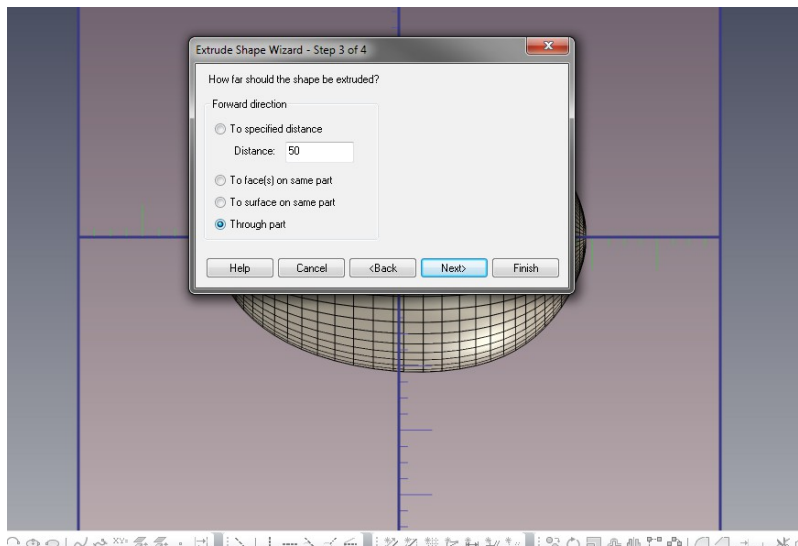
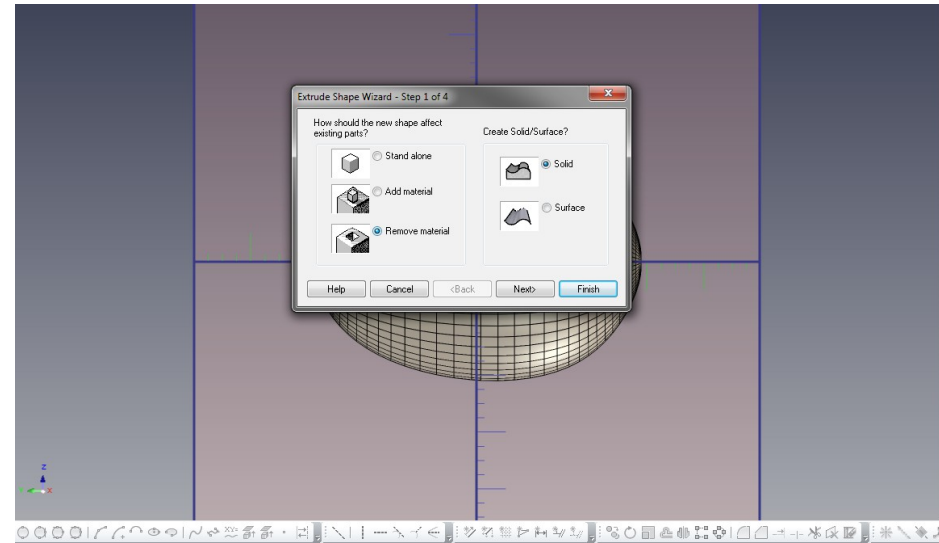
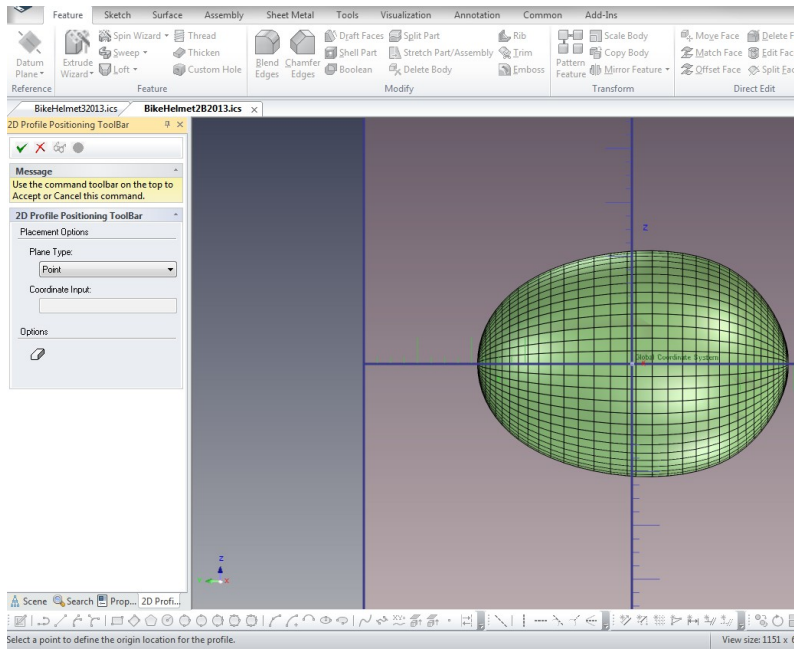
Change Camera Picker to the Left from the View list.
Press the F10 key to activate the TriBall and rotate part
by 3.5 degrees to tilt the front downwards of the
horizontal plane.

Change Camera Picker to T.F.L. Again from the View list.
And select the Extrude Wizard from Feature tab



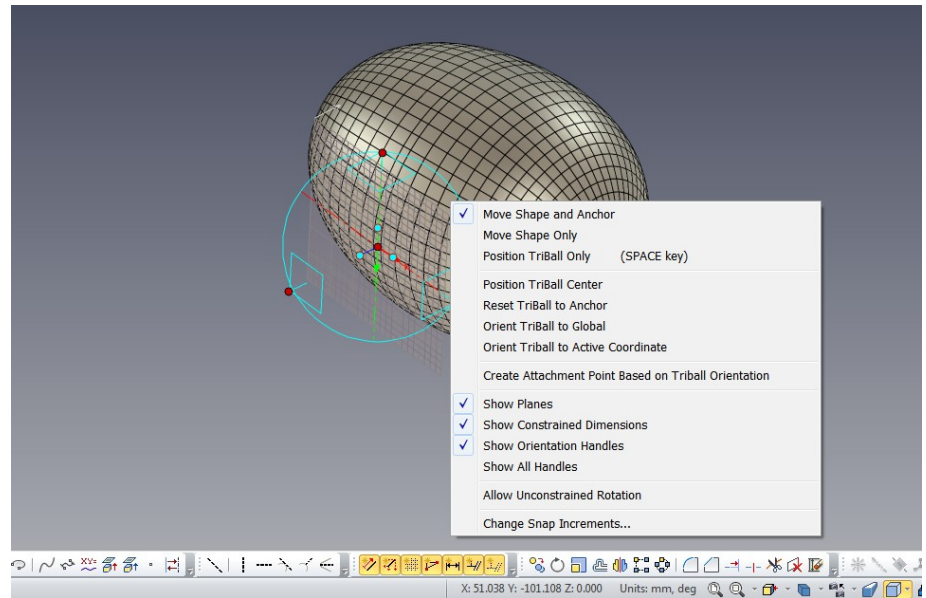
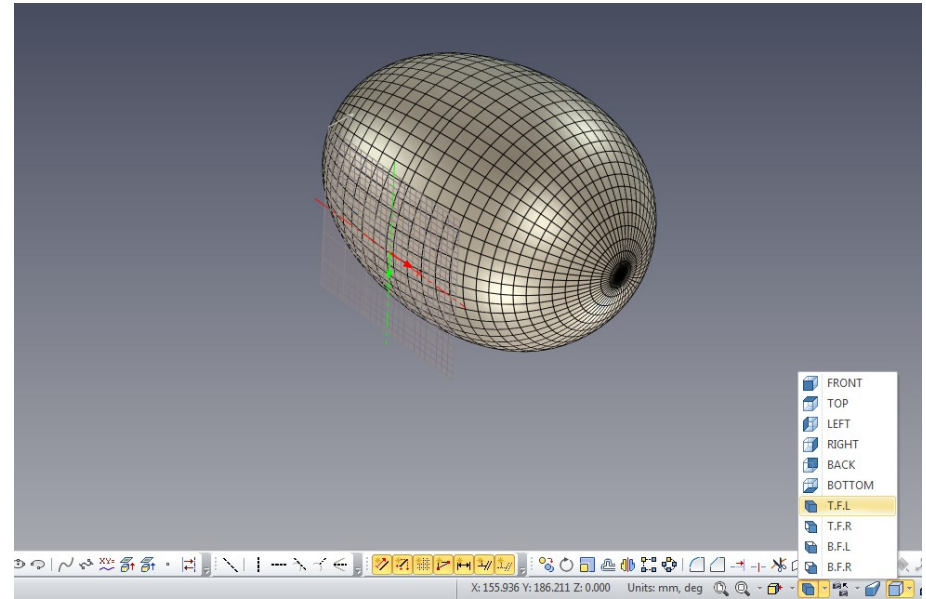
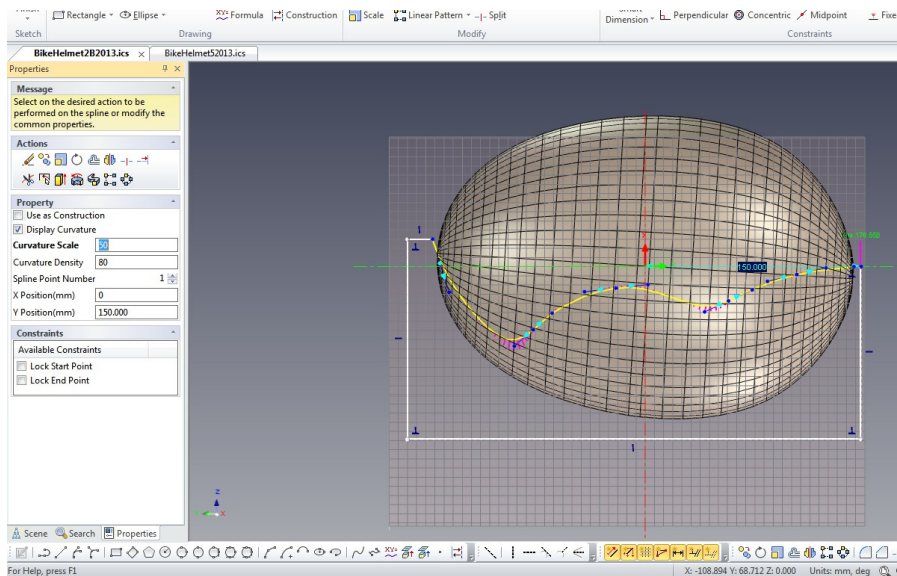
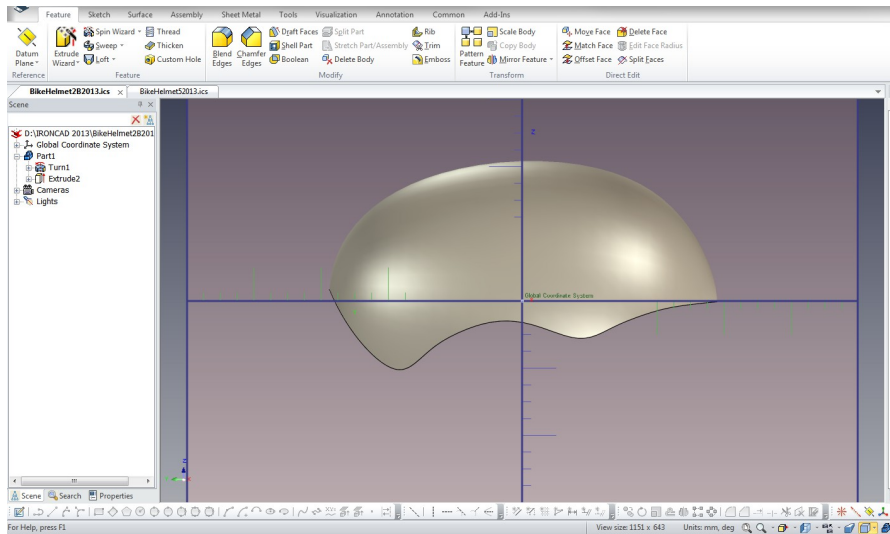
Select the Extrude Wizard from the
Feature tab to create the cut to Part1

Pick the center of Part1 as the point and follow the selected settings on the Extrude Shape Wizard steps

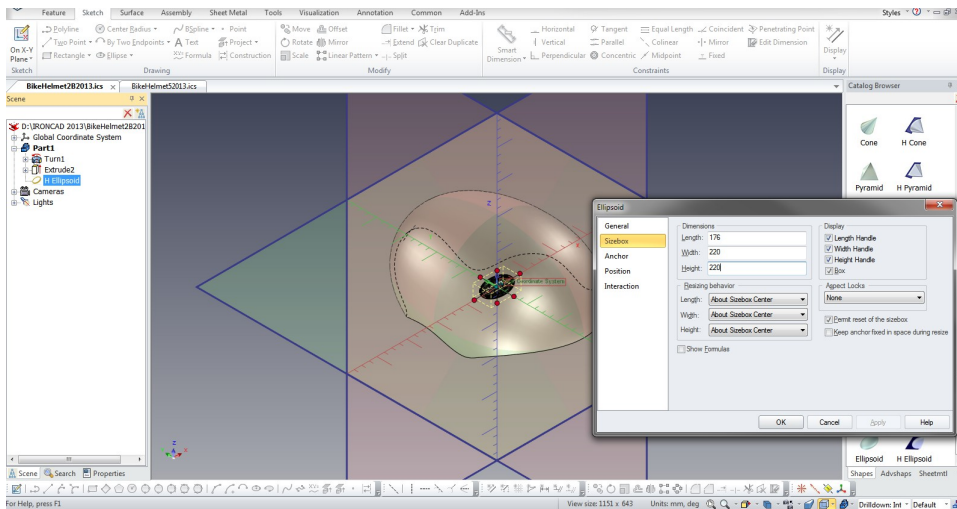
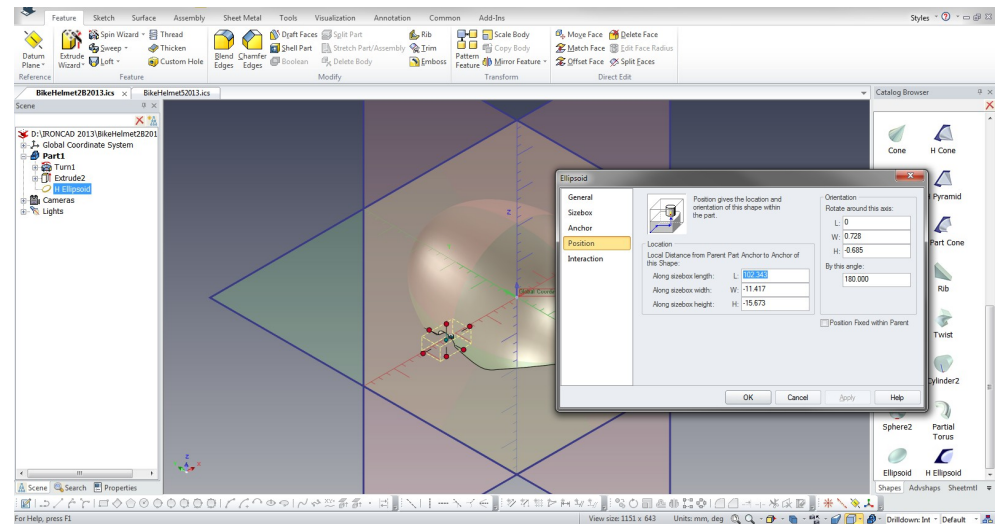
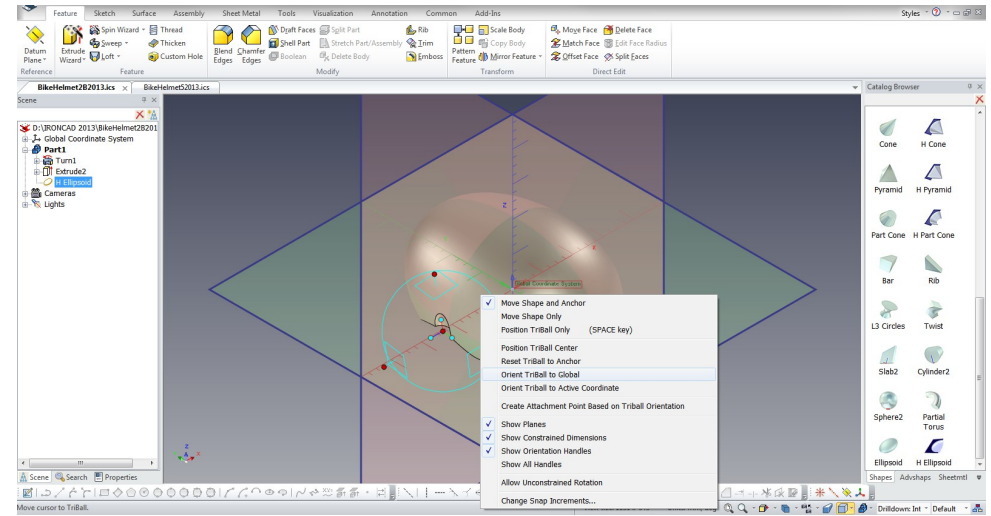
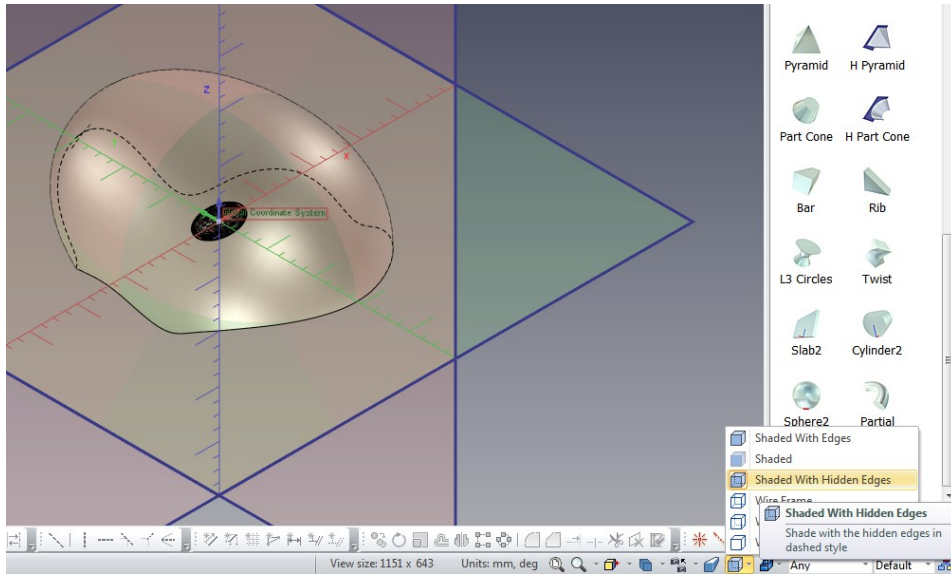


Select Finish button

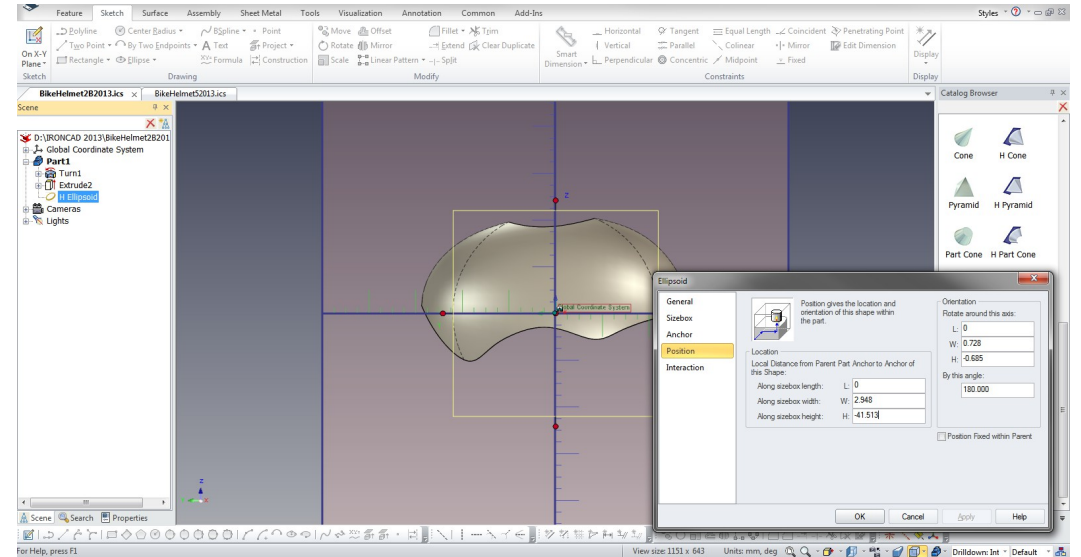
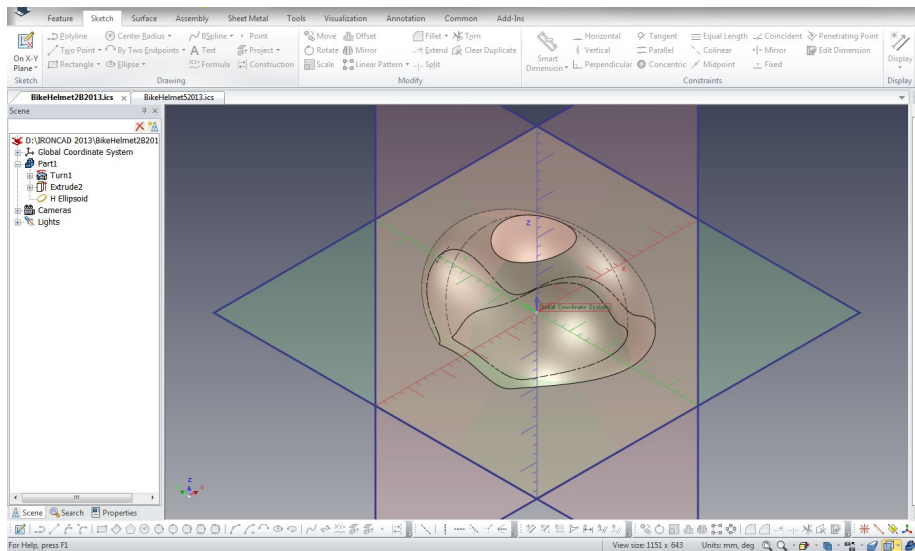
With the extrude drawing grid displayed, press F10 to activate the TriBall and right click inside the TriBall to display commands and select Orient TriBall to Global and rotate to ensure it is on perpendicular to the right plane. Draw cutting lines with the BSpline and Polyline drawing lines for the desired result



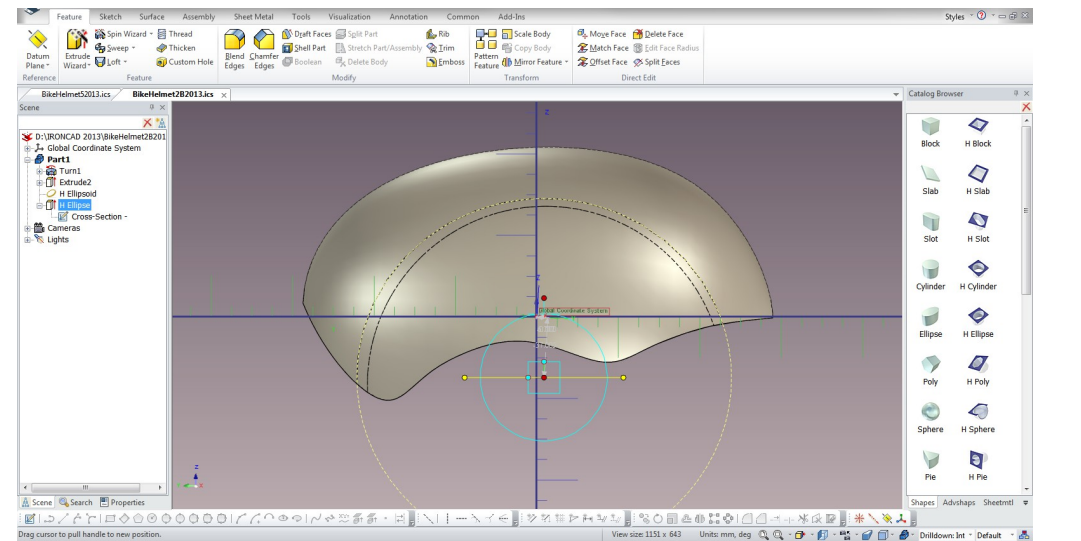
Restore to the T.F.L. Select Shaded with Hidden Edges from the Rendering selection bar. Drag and drop H Ellipsoid from the Shapes catalog to create the head cavity. Again use the TriBall and Orient TriBall to Global. Set position and re-size the H Ellipsoid to shape of the head from the reference.



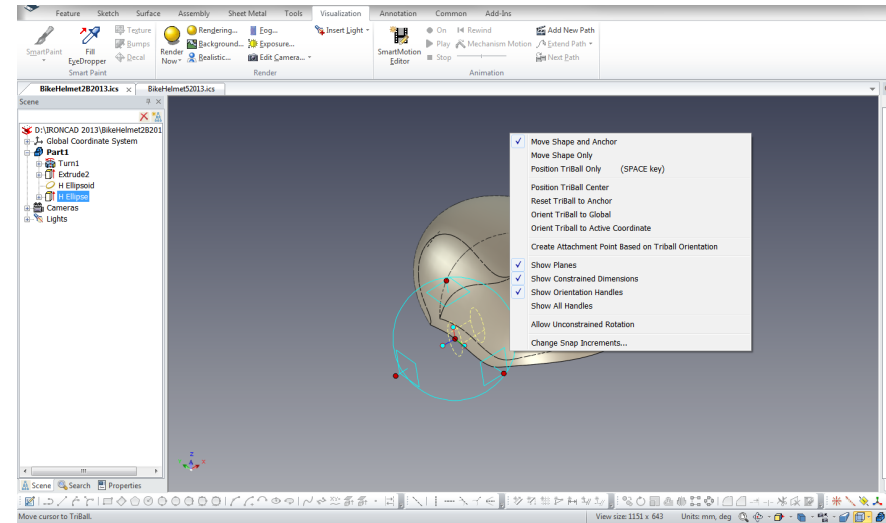
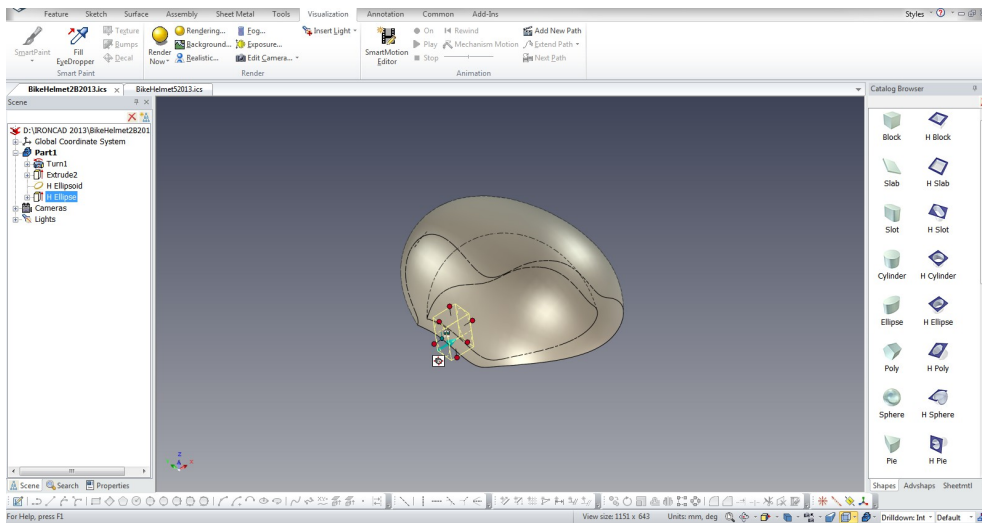
Cont'd.



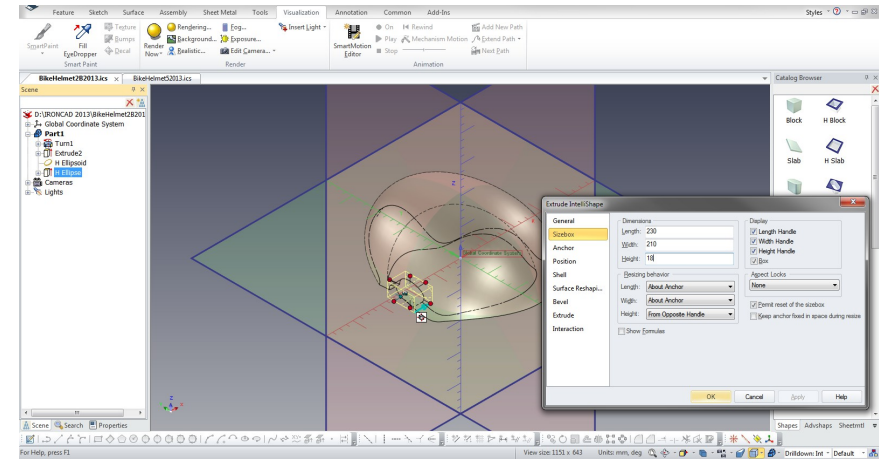
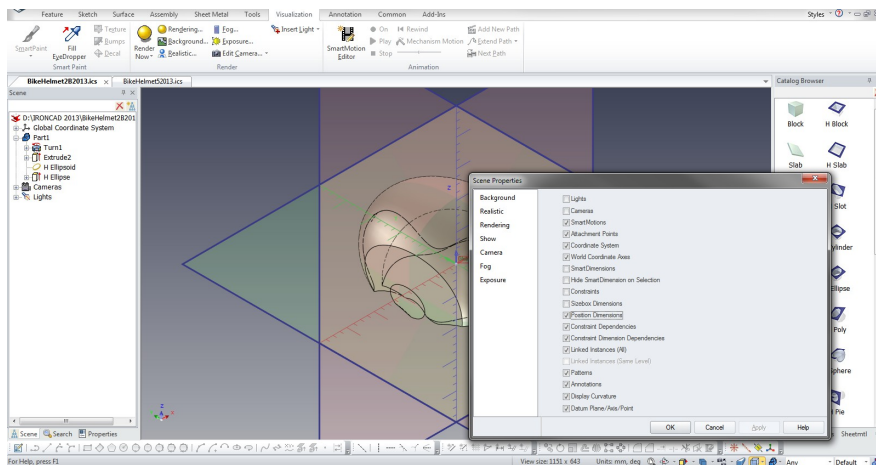
Position the H Ellipsoid as the right head cavity.



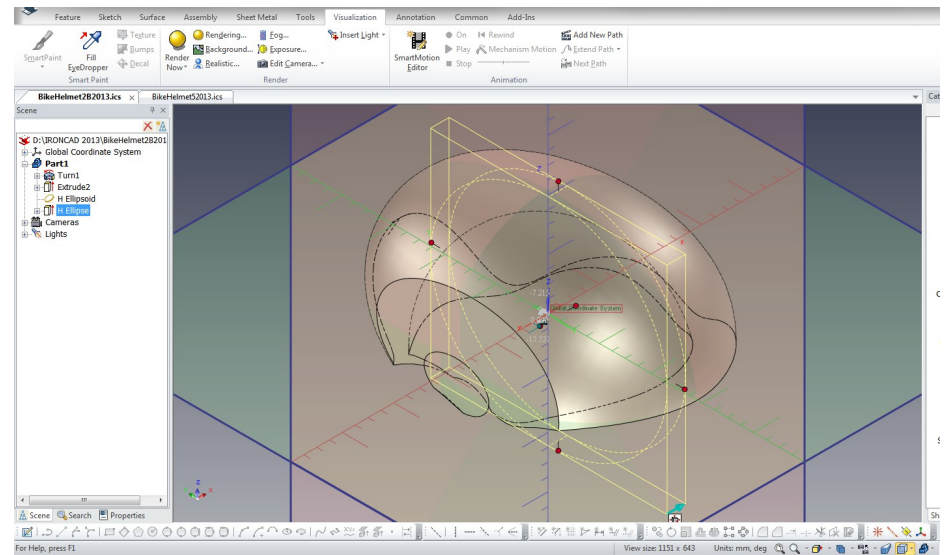
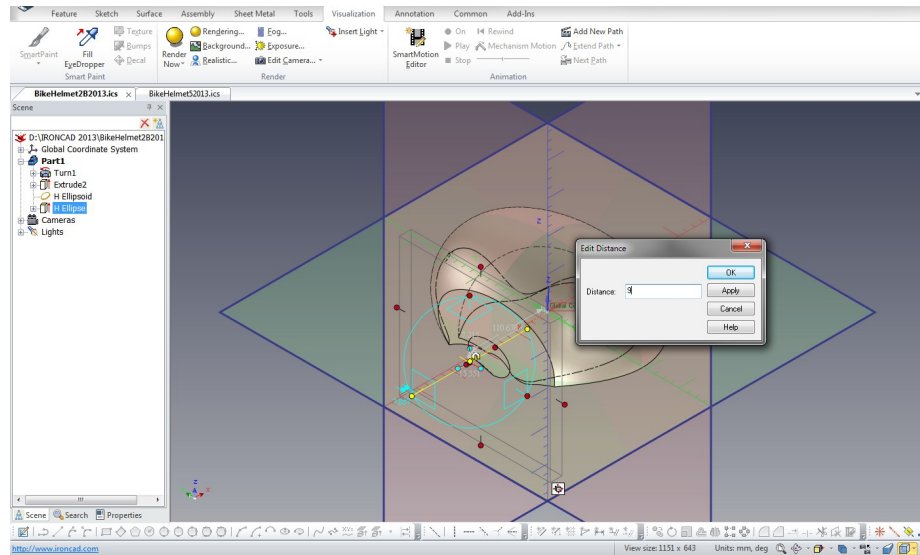
Next drag and drop H Ellipse from the Shapes catalog to create the vent groove. Again use the TriBall and Orient TriBall to Global.



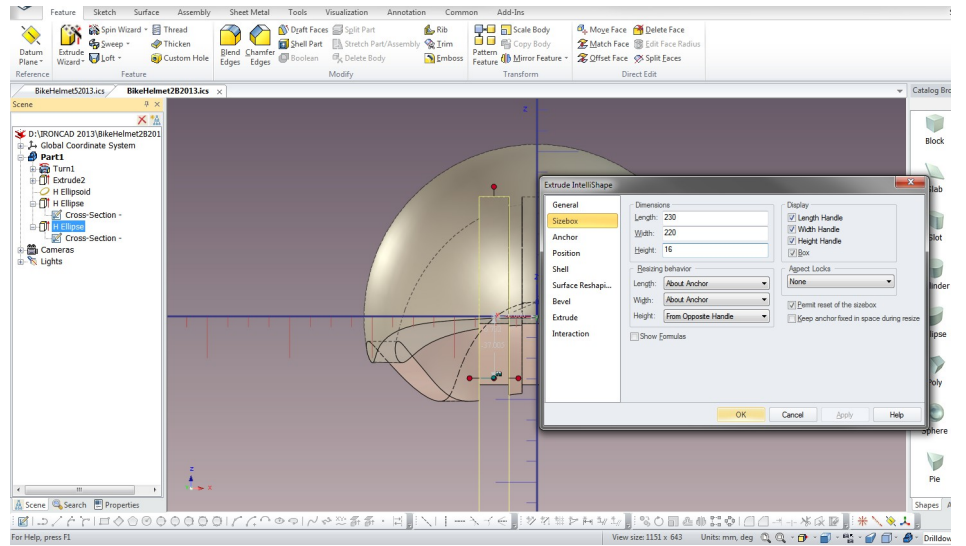
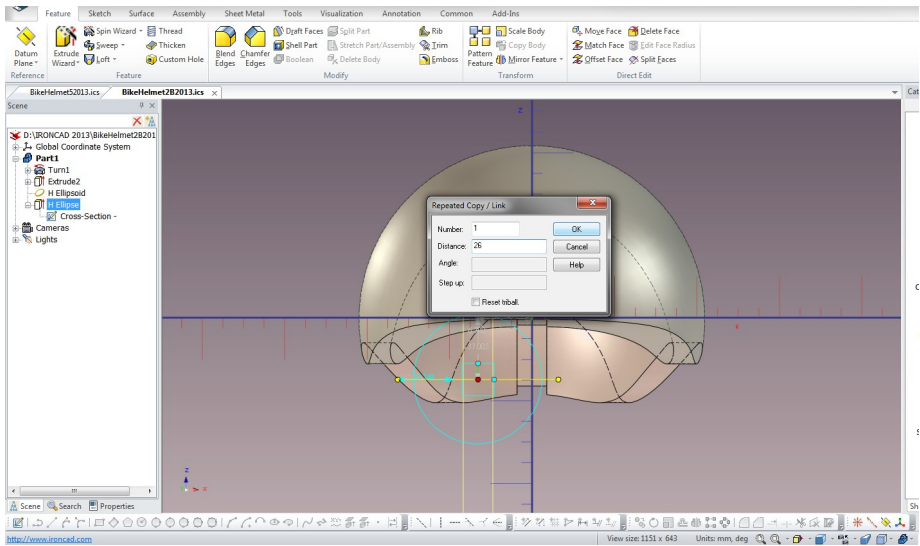
Right click Scene to select Scene Properties > Show > Tick Position Dimensions. Right click H Ellipse > Properties and edit Sizebox.



Select H Ellipse with new size, click on anchor to change position using the TriBall to the center of the H Ellipse. Deselect and edit Position to zero.

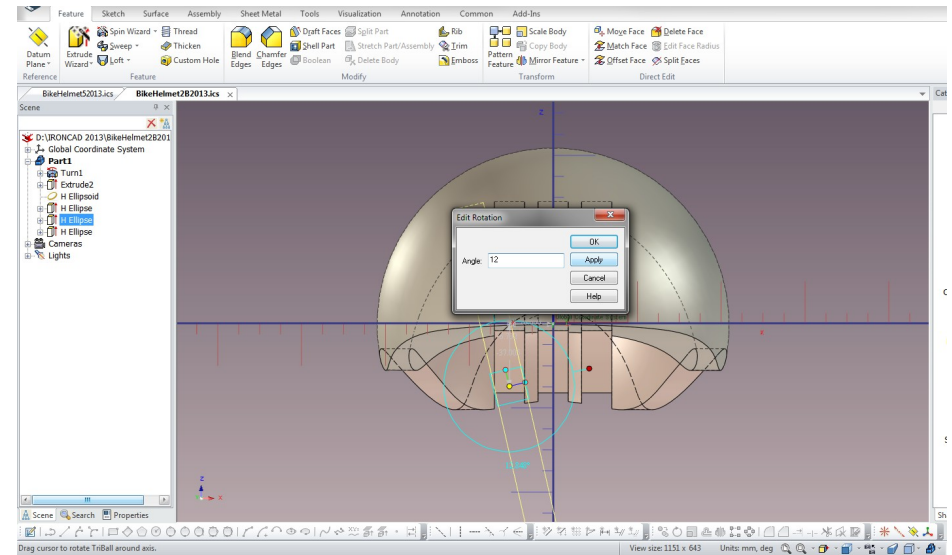
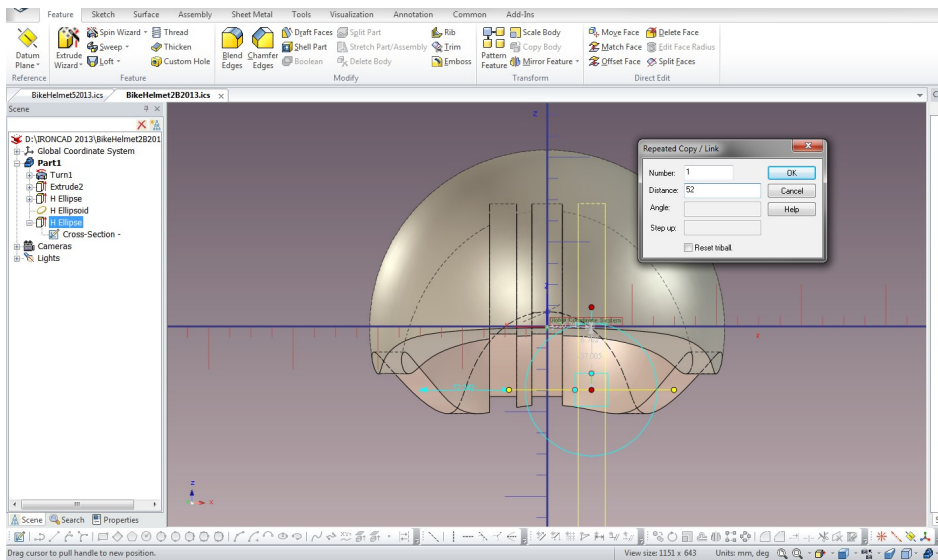


Change View to Front and use the TriBall to copy the H Ellipse to left, and re-size the Height/Depth of the copied feature.



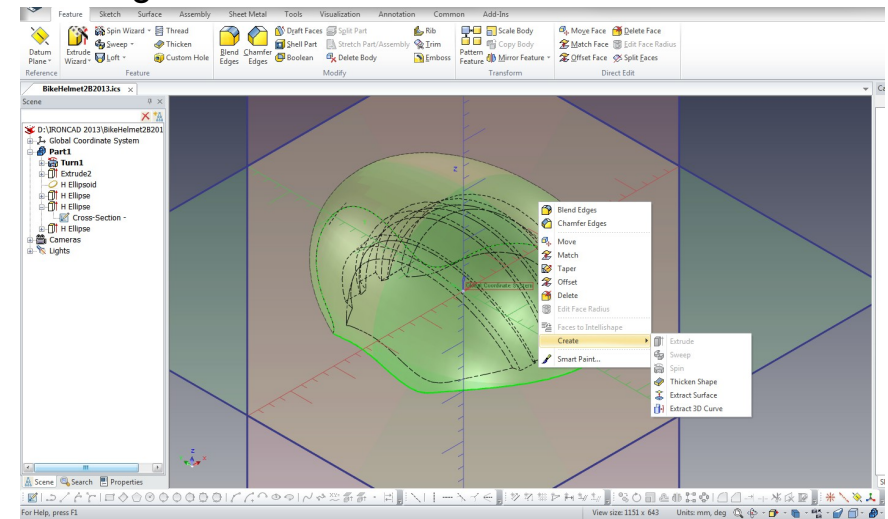
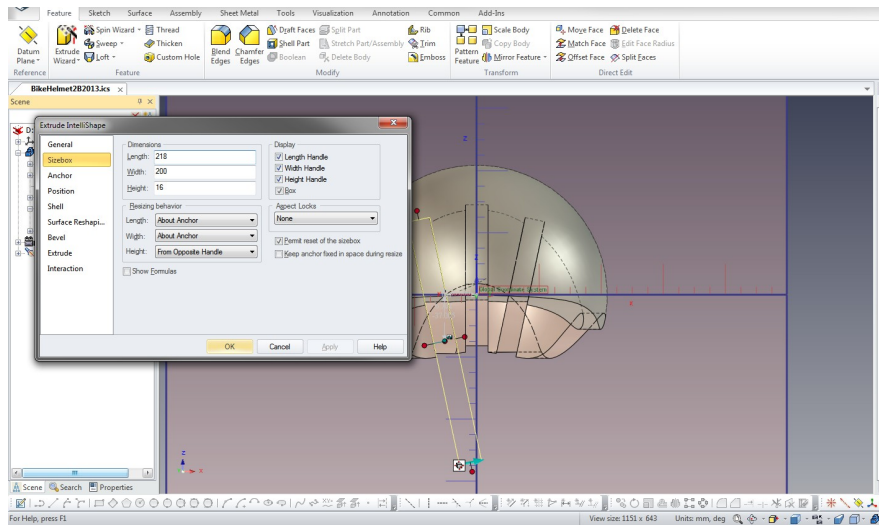
Repeat the procedure to create the feature on the right.

Change rotation of the copied H Ellipses in opposing directions.

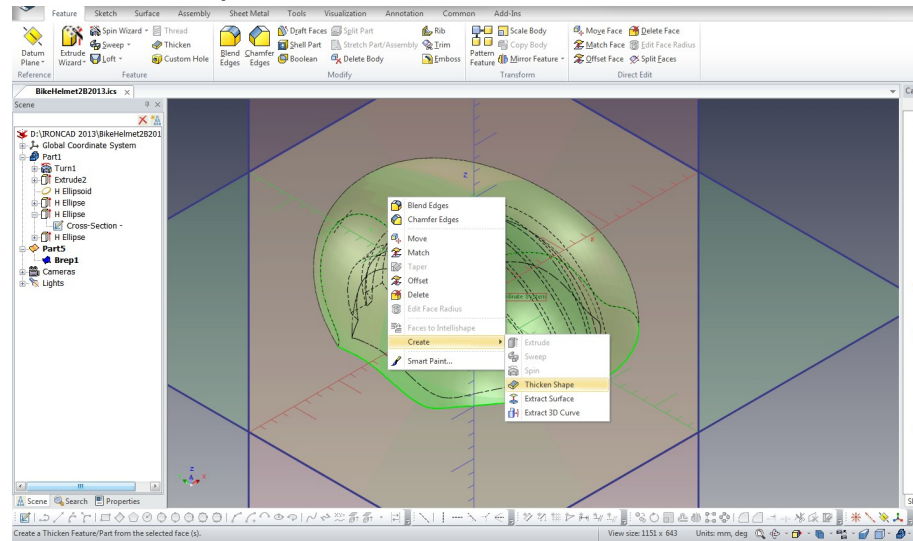


Re-size both copied H Ellipses.

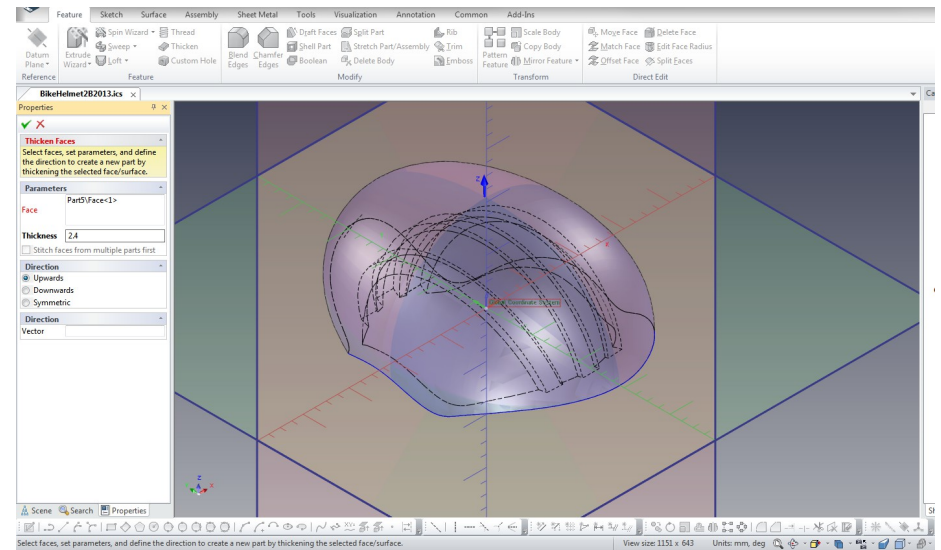
Next, create an outer shell, select part and click to go into feature. Right click and select Extract a surface.



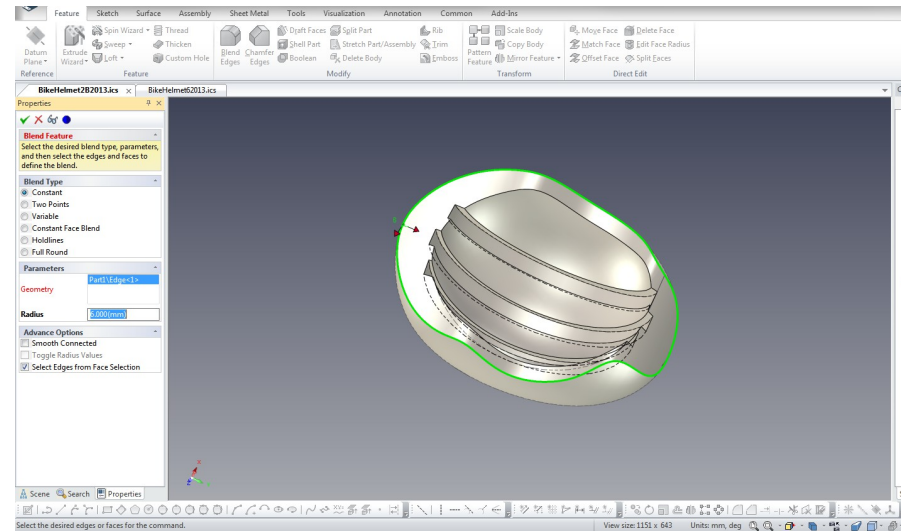
Select Part5 Brep, right click and select Create > Thicken Shape.



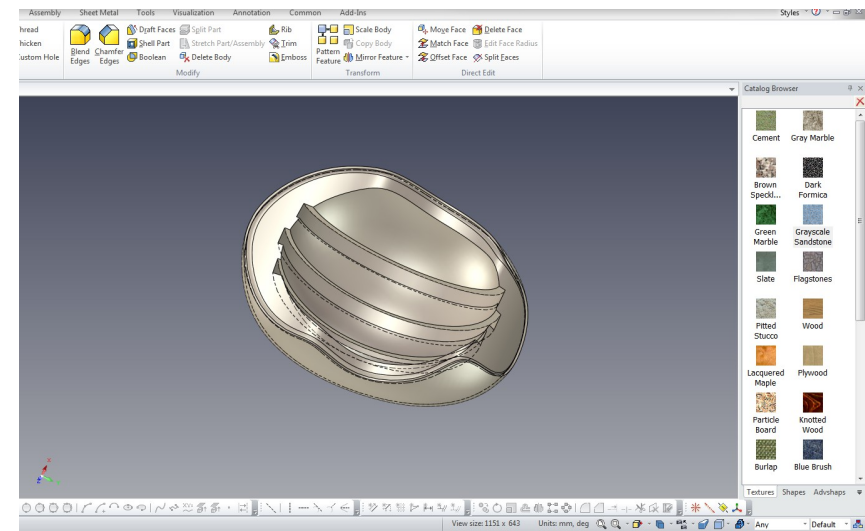
Specify the thickness and click the check to apply



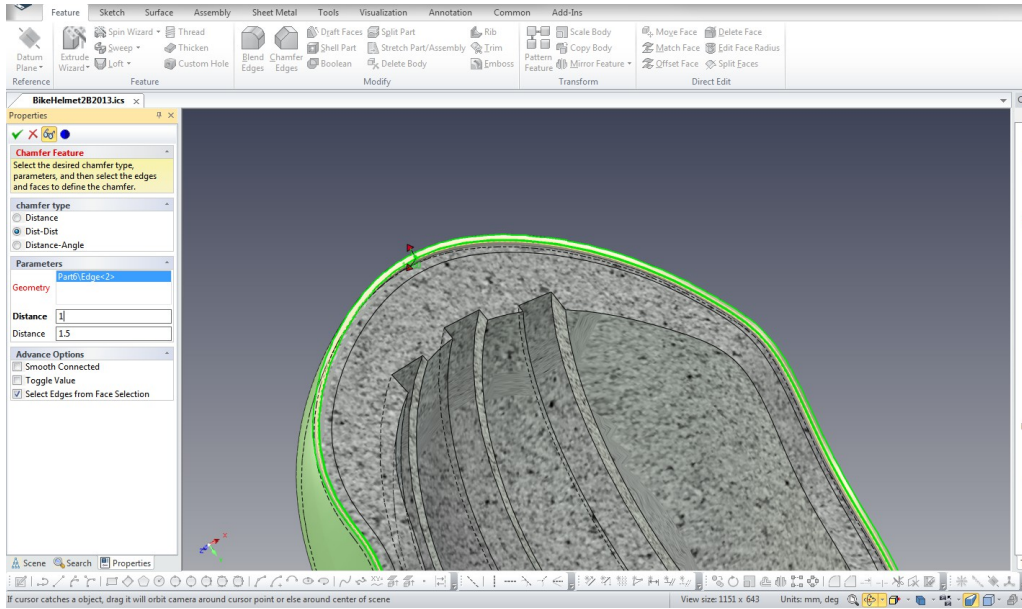
Select View > Rotate and select the outer edge Part1 and set blend



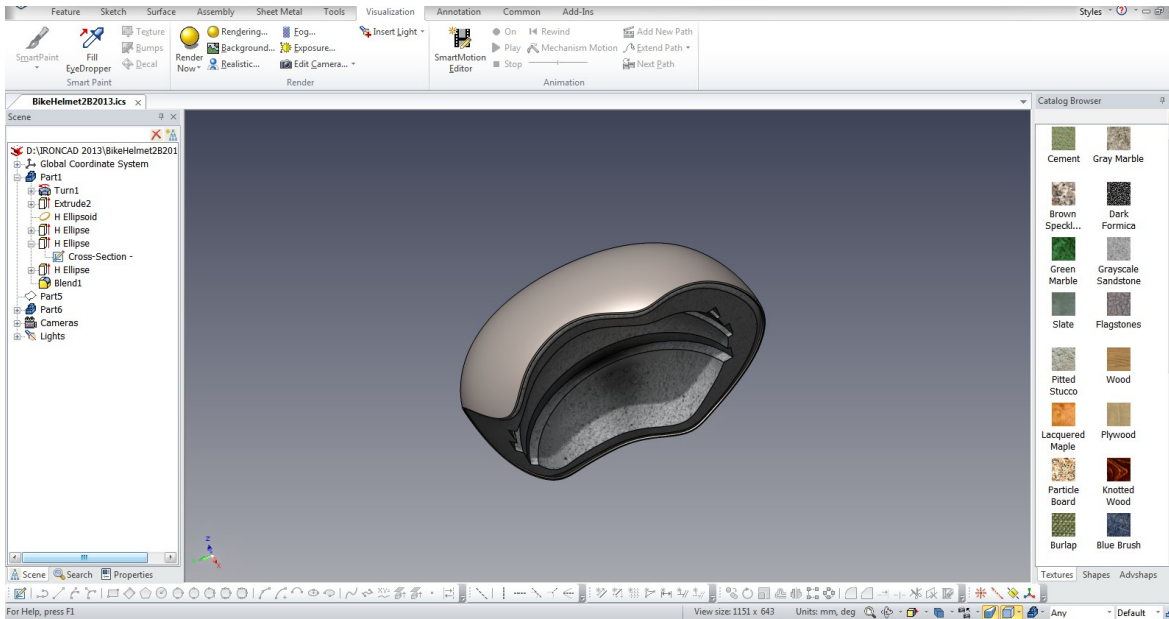
Drag and drop Grayscale Sandstone texture to Part1



Select Part6 , Select the edges and set chamfer features



Realistic Visualization



File: BikeHelmet2B2013.ics