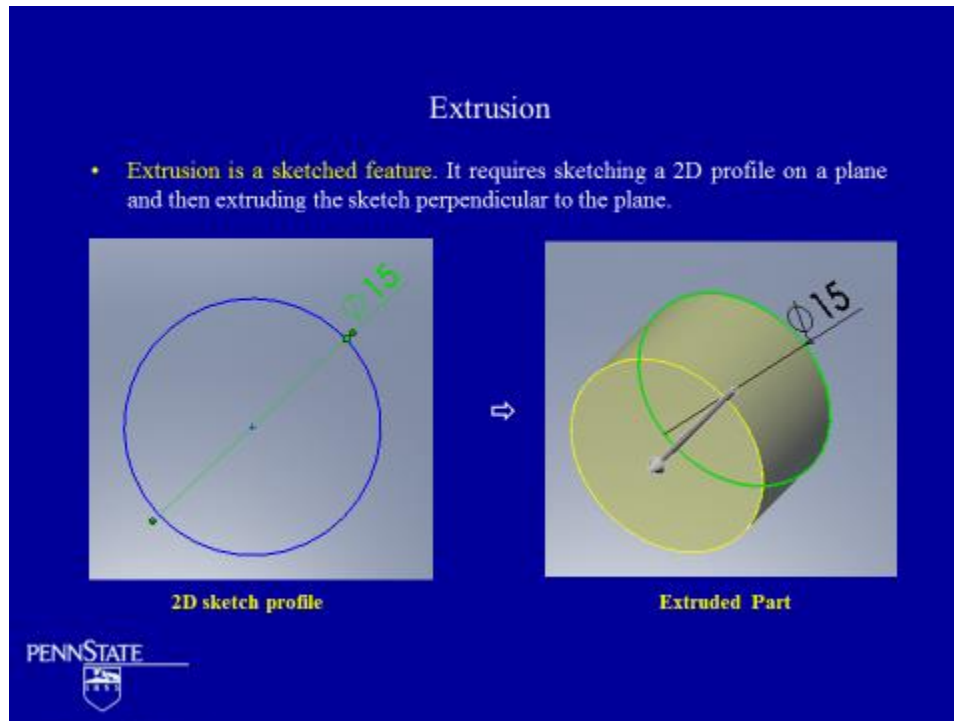


## Engineering CAD (Solidworks)

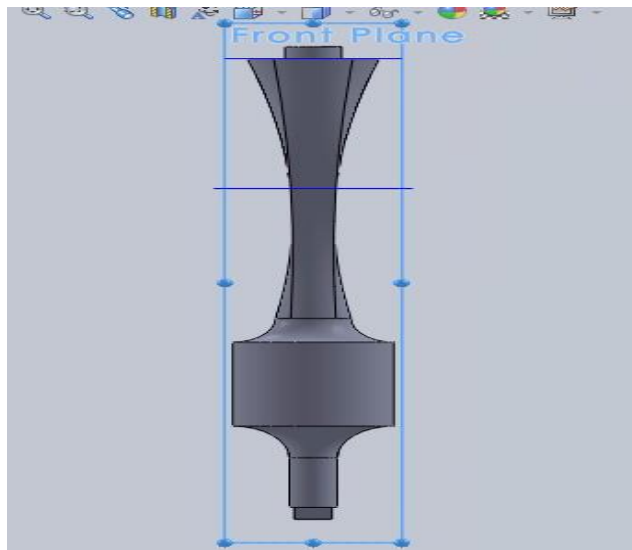
This semester at Penn State, I learned how to the importance of 3D modeling objects via soft wares such as CAD or Solidworks. The programming has unique features such as parts, assemblies, and drawing.

### Part

Models are built from 2D sketches and then a command such as an extrusion, revolve, loft, etc. leads to the drawing becoming a 3D object.



Here is a picture of a part that I assembled in Solidworks. It's a leg to a table.



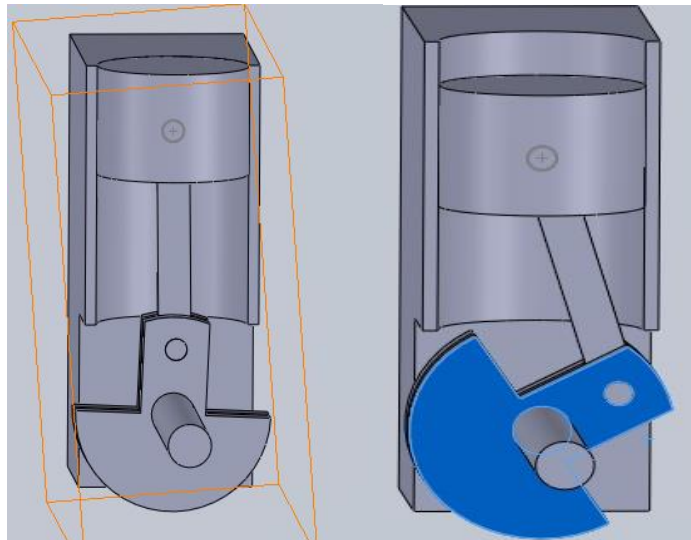
## Mating of Parts within an Assembly

### Mates

- Mating relationships precisely position the components with respect to each other.
- They define how the components **move** and **rotate** with respect to other components.
- Mates are for limiting the movement in all **six degrees** of freedom. These are movements along X, Y and Z axes, and rotation around X, Y and Z axes.

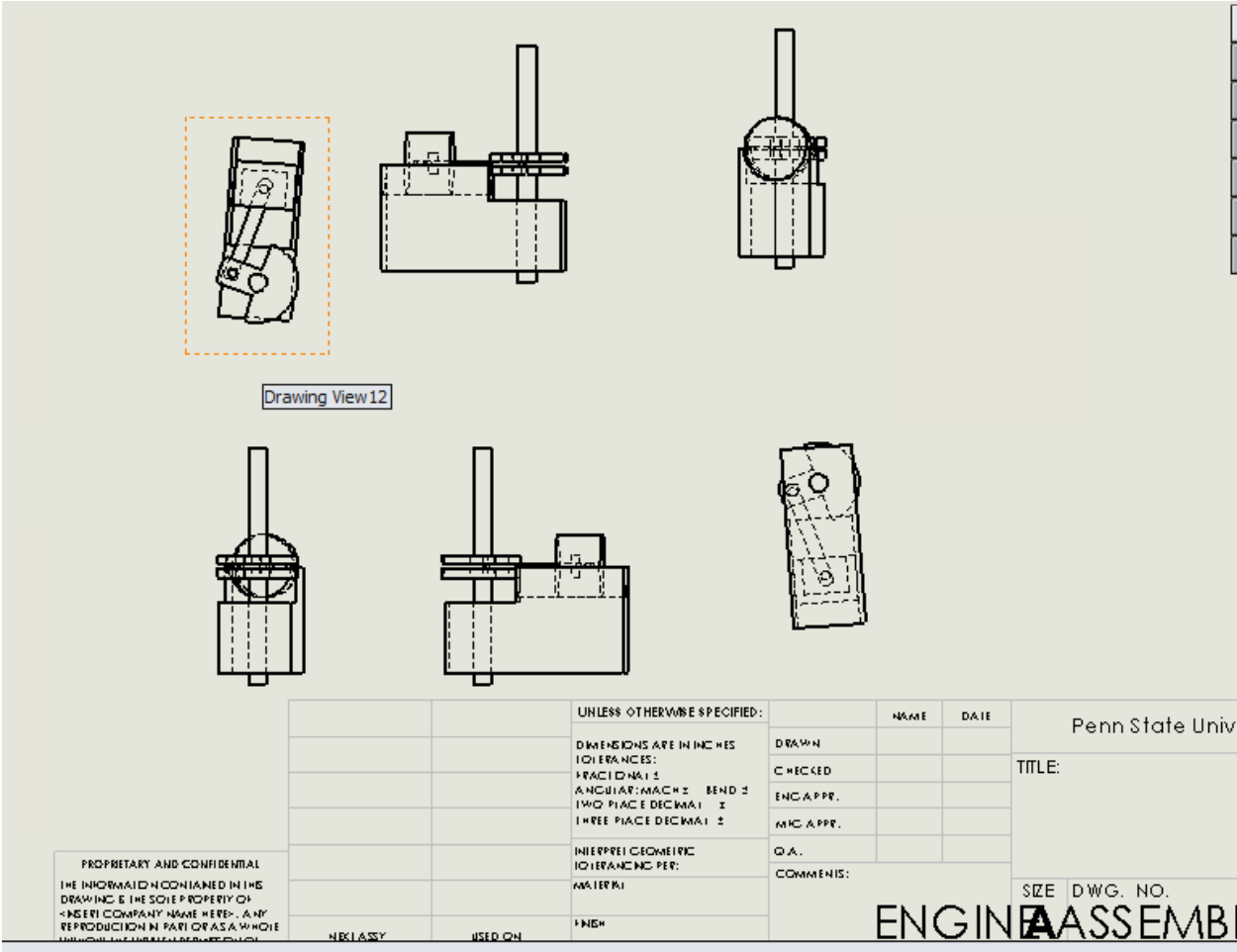


We then had to make assemblies which allowed for a whole bunch of parts to be attached together. Here is a picture of an assembly of an engine made up these parts: an engine case, a crank, a piston, and a rod. They were set up in such a way with the mates that the crank rotates when the rod is turned and the piston moves as a result of this.



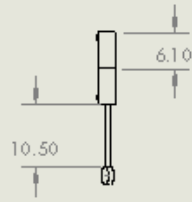
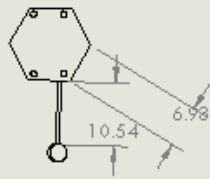
Drawing: Where we took the View of an Assembly and put it into a Multi-View format.

Here is an example of the engine put into the Multi-Views via the Drawing section of SolidWorks



Important to Dimension Drawings

Here is an example in which I took an assembly of a Grandfather clock and used the Drawing feature to put the clock into the three main Multi-Views and dimensioned it.



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CLOCK ASSEMBLY DRAWING

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