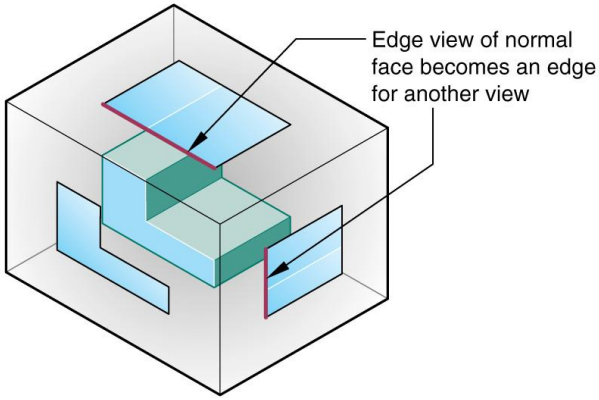
Engineering Drawing

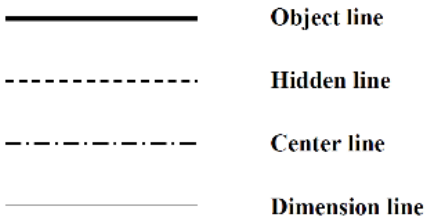
With Junfeng Ma

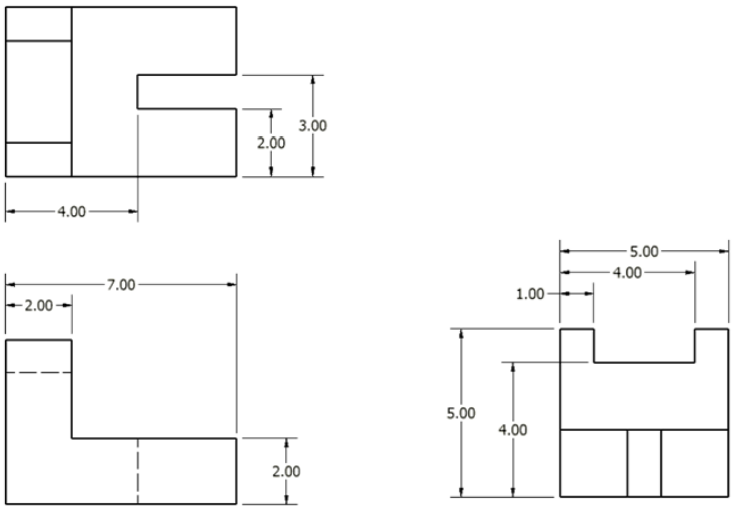
Created By: Rachel Stiller

Multi View:

In engineering design 100 at The Pennsylvania State University, Junfeng Ma taught us many skills necessary in order to create successful and professional engineering drawing sketches. The first step was to learn how to create three view/multi views drawings from a given isometric view. This is necessary to know how to do in order to draw parts from their front right and top side views. To properly draw the three views you must view it as this picture demonstration shows. All three views have common reflection lines and need to be drawn lined up on the graphing paper. This ensures that the drawing is correct and properly to scale. When creating these drawings, four specific types of lines need to be used. They are as follows. The object line is the most used and is used to draw around the outside of the part and any solid lines necessary. The hidden lines represent cuts and holes that you can't see directly from certain views. The center line is used for the centers of circles and the dimension line is used for dimension parts after you are done drawing them. This is one example of a complete multi view drawing with dimensions.

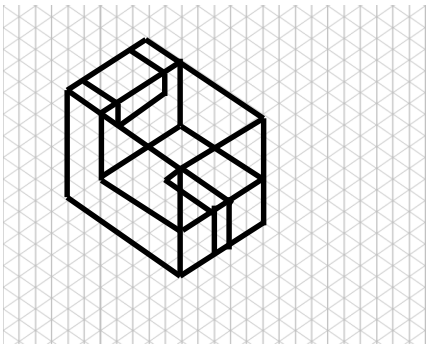


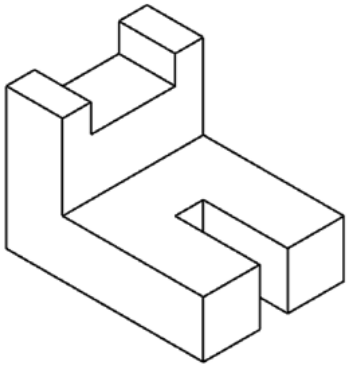




Isometric:

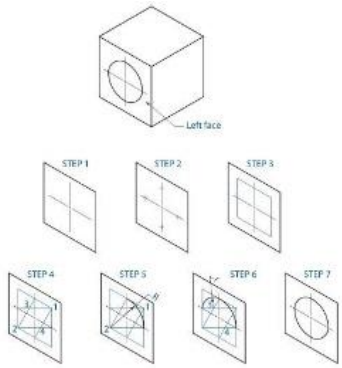
After we mastered the art of multi view drawing, it was necessary to move onto isometric drawing. In this type of drawing you must use isometric paper which has a ton of small cubes all of the paper, scaled at a quarter of an inch per block. You use the three views learned in the last part to model the part in three dimensions. From the above, multi view sketch with dimensions you can turn it into an isometric. The first step is to draw the entire cube with all of the details from each sketch and then to erase the lines that you do not need and complete the part. Here is one quick example from the multi view above.





Cylindrical Surfaces:

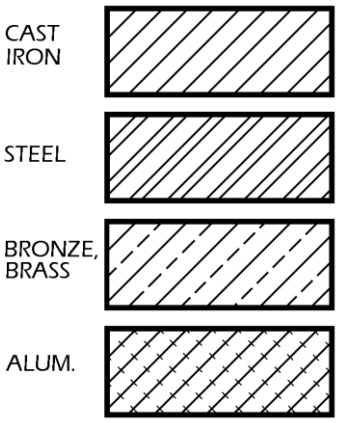
We also learned how to draw cylindrical surfaces. This became difficult and redundant at some points, but was necessary because most part include holes and cuts that are cylindrical. In order to create successful cylinders, it was necessary to use the seven step process. This step is visually described in this picture. It made it easier to draw perfect cylinders and made our drawings look way better than if you just draw a cylinder by hand.



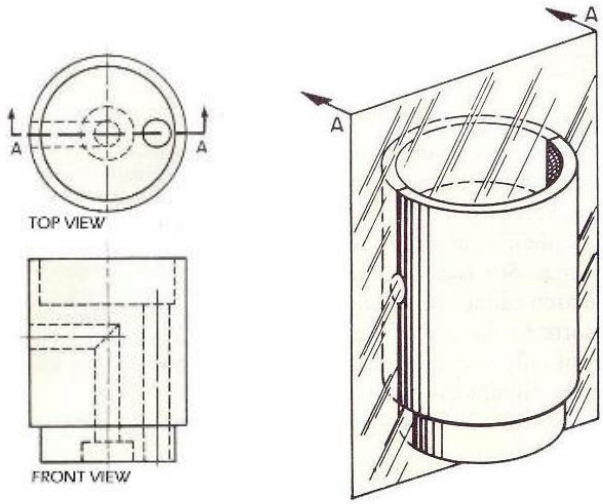
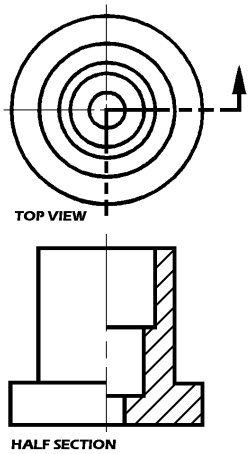
Section Views:

The last thing we learned how to draw, was section views. These were by far the most difficult and confusing because you had to draw a picture of a specific section of a part. Within section views, you can make half section views, full section views, offset sections, aligned sections, revolved sections, broken out sections, assembly sections and section shafts. You can

see where this begins to get confusing. Full section and half section views are used most commonly. A full section is where the cutting plane line passes fully through the part and cuts away half of the material from the part. A half section is where the cutting plane line only passes halfway through the part and cuts away a quarter of the material. Cutting plane lines are marked by a line with arrows on each end of the plane. It is also necessary to follow the proper section linings. The section linings deal with what materials are being sectioned out. This materials to tell you what material to make the part out of. Also with section lining, forty-five degree lines should be used, all lines should be uniformly spaced, thin sections should be blackened out completely, and a multitude of other rules to follow.



Full Section:



Half Section: