Chapter 6 – Title Blocks

In previous exercises, every drawing started by creating a number of layers. This is time consuming and unnecessary. In this exercise, we will start a drawing by defining layers and making a number of useful settings then we will save the file. This file will be the start for subsequent drawings. You will use the file by opening it each time you want to start a new drawing then using the "Save As" to save the drawing as a different file. This method will eliminate much of the setup time required for each drawing.

We will also look at creating drawings with a border and title block. Most engineering drawings have borders and title blocks that name the part in the drawing; tell when it was drawn; and who did the drawing. We will create drawings with this type of title block.

Standard Drawing Sheet

Most of the parts we draw are measured in millimeters so we need to setup AutoCAD to work in those units. By default, it is setup to working in inches which is not particularly useful here. Start AutoCAD and once it has started, click on the large red "A" in the upper left corner to open the menu shown below.

Drawing Units

Next, click on Drawing Utilities then on Units. This opens the dialog box shown below.
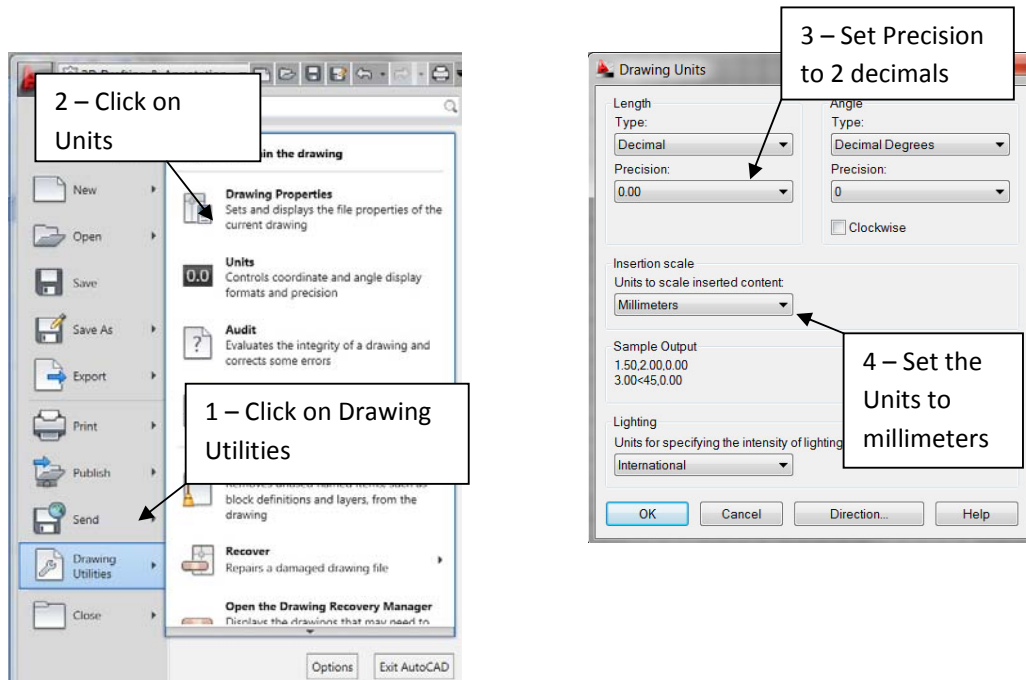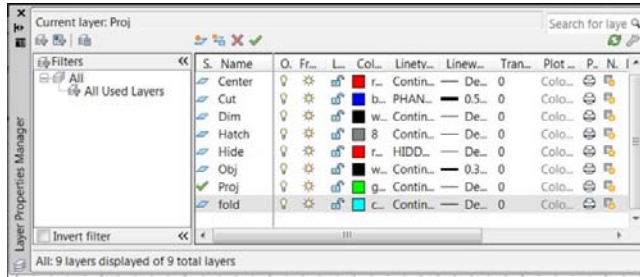
Layers

The next step is to create all of the layers you think you might need. You can always come back and add new layers but in our studies so far, we have defined layers for objects, centerlines, projection lines, dimensioning, hidden lines, cutting planes, folding lines, and cross hatching. These layers should be created at this time as shown in the layer definition box above.

Model Plotting Page Setup

Since we are creating a starter file that will contain most of the settings we normally make, we can save some time by setting the page size and plotting options. Click on the red "A" in the upper left corner of the AutoCAD window and then click on "Print" then "Page Setup" as shown below in the diagram on the left. This brings up the page setup manager. If we had several different printers, we could define a different page for each printer. We have only Adobe PDF so we will modify the definition for the *Model* page. Make sure the *Model* line is highlighted then click on the "Modify" button.
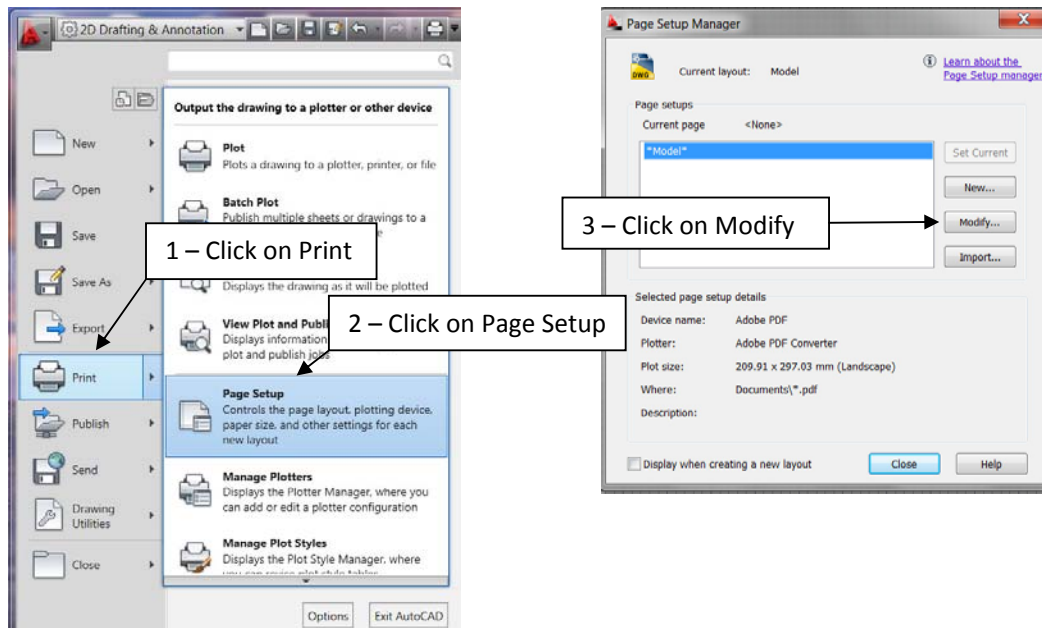
Clicking on Modify brings up the setup for *Model* which is shown below. In this dialog box we will make several changes as listed below.

1. Select "Adobe PDF" for the name of the Printer/Plotter.
2. Set the paper size to "A4"
3. Select "Limits" at the Plot area
4. Make sure "Fit to paper" is checked
5. Select "mm" as the units
6. Click on OK when you have finished
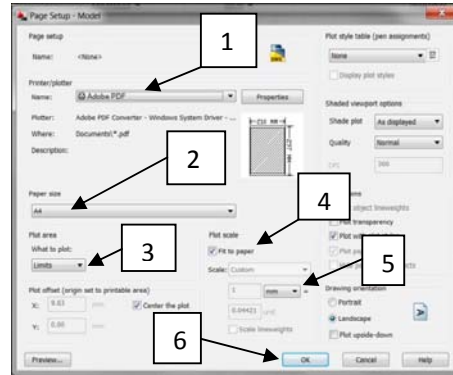
Clicking on OK returns the program to the "Page Setup Manager" dialog box shown above. Click on Close in that dialog box to dismiss it.

Layout Setup

The drawings we have been creating are generated in what is called "Model Space". In "Model Space" we use the actual dimensions of the part we are drawing. Using actual sizes makes it very easy to dimension. The dimensions automatically created by AutoCAD are the actual dimensions of the part.

Engineering drawings are usually plotted on a sheet of paper and that sheet of paper has different dimensions from the part. To accommodate the fixed size of the sheet of paper, the image of the part is scaled to fit on the paper.

To make the changes, you need to switch to the "Layout" sheet. You can do this by clicking on the "Layout1" tab. The screen will change and show the layout. The layout is similar to the print preview except that you have the ability to add information and adjust what is displayed and its size.
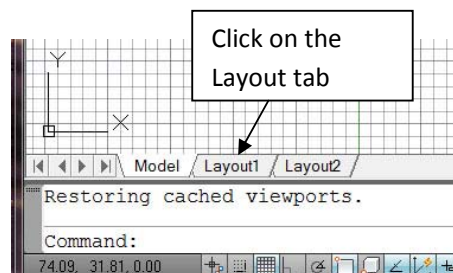
We must first define the paper size and printer used for printing the layout. We use a method similar to the one used to define the paper size for printing the model. Click on the big red "A" then on

Print → Page Setup

That produces the dialog box shown below. It is similar to the one used to select the model printing setup we selected before but this time we are selecting the layout printing setup.
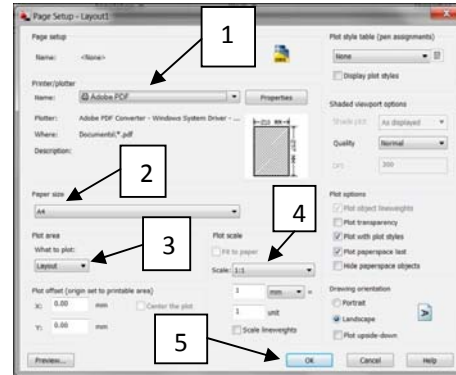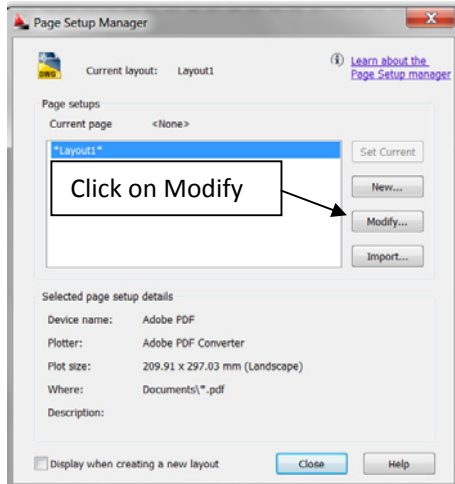
Click on "Modify" in the "Page Setup Manager" then in the "Page Setup" dialog box make the following changes.

1. Select Adobe PDF for the printer
2. Select an A4 paper size
3. Select Layout as what to plot
4. Select a scale of 1:1
5. Click on OK when you have made all of the changes.

When you have finished click on "Close" in the "Page Setup Manager" to return to the layout screen. At this point we are going to save the AutoCAD file we are working on and draw a title. Use a name like "Startup_Drawing_A4". **Remember from now on, you will start a drawing by opening this file then immediately use "Save As" to save the file under a new name.** You will actually create your drawing in this new file. The "Startup_Drawing_A4" file will not be changed.

Creating the Title Block

Next we are going to create the border and title block that you will use on subsequent drawings. You have just saved the start up file and we are going to use "Save As" to save it again. This time use the name "Title Block" for the name of the file.

1. Click on "Model" tab at the bottom left of the window.
2. Next create a new Layer called "Title". This layer should have a continuous linetype, a dark color, and be approximately 0.5 mm thick.
3. Make this new layer the current layer.

Next we will draw the page borders. An A4 page is 297 mm wide and 210 mm high. We will make the page borders a little smaller than the. That will leave some room at the edge of the paper that does not have printing. We will make the borders 270 mm wide and 190 mm high. Start by typing:

```
Line
Specify first point: 0,0
Specify next point or [Undo]: @270,0
Specify next point or [Undo]: @0,190
Specify next point or [Close/Undo]: @-270,0
Specify next point or [Close/Undo]: c
```

When you have finished, you will have a drawing like the one on the right.

Next, we will draw actual title block. This is the area where we will write:
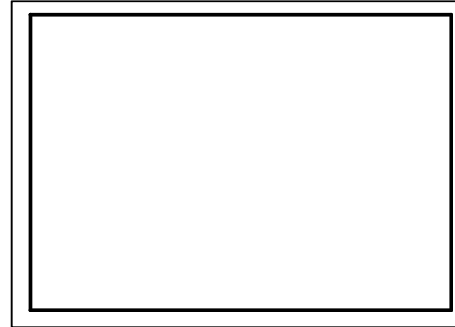
1. Your name
2. Your student number
3. The date the drawing was made
4. The page number
5. The total number of pages in the set of drawings
6. The part name

We can create most of the title block using the **OFFSET** command. First we will create two new horizontal lines across the bottom of the sheet. These new lines will be 10 mm apart.
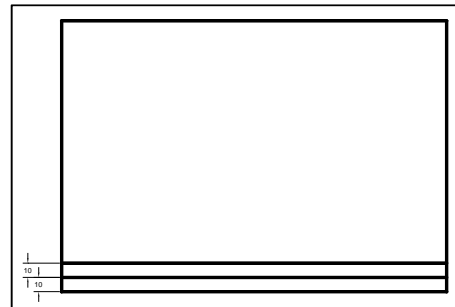
```
Offset
Specify offset distance: 10            {Spacing}
Select object to offset <Exit>:        {click on bottom line of the title block}
Specify point on side to offset:       {click above the bottom line to place the
                                        offset line}
Select object to offset:               {Click on the line you just created}
Specify point on side to offset:       {Click above the new line to create
                                        another offset line}
Select object to offset:               {Press Enter to end the command}
```

The sheet border with the new offset horizontal lines is shown above on the right. We now want to draw vertical lines to break up the title block area into parts for the six items listed above. Again we will use the **OFFSET** command. We will create a vertical line 135 mm from the left side. This line will be in the middle of the page which is 270 mm wide.

```
Offset
Specify offset distance: 135          {Offset distance}
Select object to offset:              {Click on the left border of the page}
Specify point on side to offset:      {Click in the page border to the right of
                                      the left side}
Select object to offset:              {Press Enter}
```

Now we will repeat the process by offsetting the line we just created 70 mm to the right. This will approximately divide the right half of the page into halves.

```
Offset
Specify offset distance: 70           {Offset distance}
Select object to offset:              {Select the line in the middle of the page
                                      we just created}
Specify point on side to offset:      {Click to the right of the line}
Select object to offset:              {Press Enter}
```
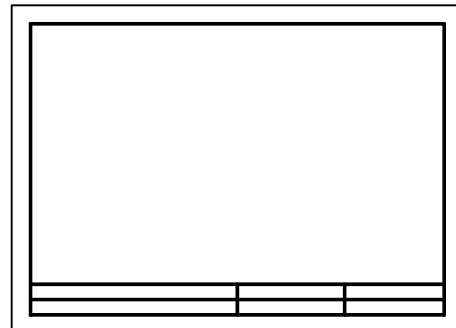
When you have finished, you should have a drawing similar to the one on the right. Your drawing, of course does not have the dimensions showing the spacing between the lines.
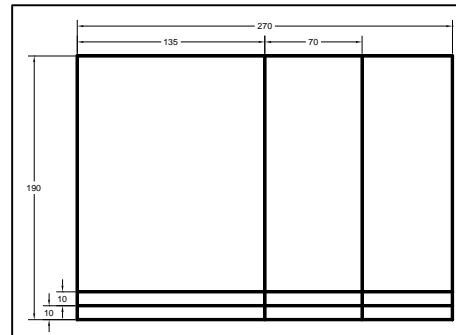
Next use the **TRIM** command to remove the unnecessary lines so that the final drawing looks like the one on the right.

Now you can write your name and other information into the title block at the bottom of the page. We will use the **MTEXT** command to do this writing. It has some features that make it particularly good for filling in blanks. First we need to change some of the text style settings. Click on the Annotate tab then click on the small arrow to the right of the pull down tab as shown in the figure below on the right.
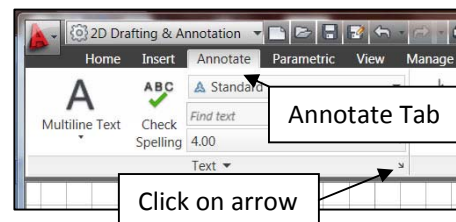
This will open the "Text Style" dialog box shown on the right. Under the "Size" make sure "Annotative" is marked. Next you want to set the "Paper Text Height" to 4.0. You might need to set it to something smaller if your name is especially long. When you have made the changes, click on "Set Current" then on "Apply".
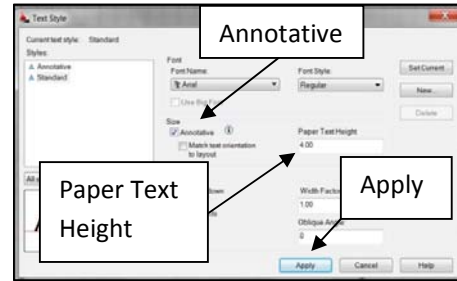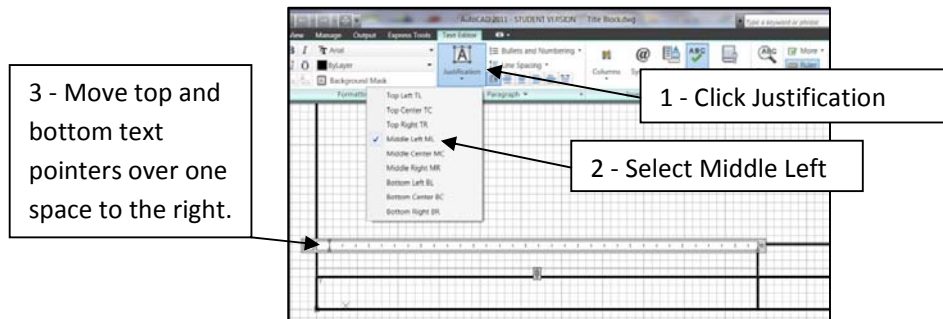

Now you are ready to write the text. You can start with your name. Enter:

```
Mtext
Current text style: "Standard"
      Text height:  4.00  Annotative:  Yes
Specify first corner:                 {click the intersection at point 1}
Specify opposite corner:              {Click the intersection at point 2}
```
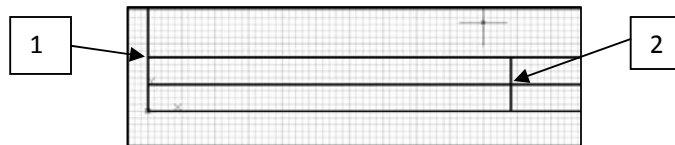

At this point, a text alignment scale appears and establish how the text will be justified and where it will start.

3 - Move top and bottom text pointers over one space to the right.

1 - Click Justification

2 - Select Middle Left

Once you have made these changes, enter: "Drawn by: Your Name" as shown below. When you have finished entering your name, click somewhere away from the text to terminate the command.


Drawn by: Robert Greenlee
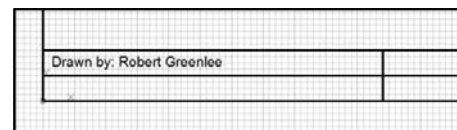
Continue with the **Mtext** command until the title block looks like the one below. You should insert your name, your student ID, a space labeled date and other information as shown below.

| Drawn by: Robert Greenlee | ID: 1922000001 | Date: |
| Part: | Sheet No. | Of: |

When you have finished with these changes be sure and save your drawing. Also make sure you DO NOT save it as the Startup Drawing.

Creating Blocks

A block is a collection of lines, arcs, text, and other graphics that have been grouped together. In essence the collection becomes a single entity. This single entity can be written as a file then inserted into other drawings and that is exactly what we are going to do with the page borders and title block we have just created. Type **Block** and the dialog box show at the right appears.
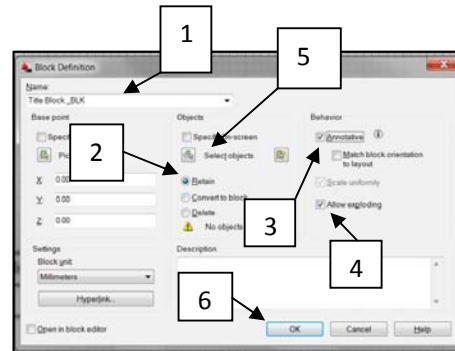
1. Enter a Name for the block. I like to add the _BLK to the name to distinguish it as a block.
2. Mark the "Retain" radio button
3. Mark the "Annotative" check box
4. Mark the "Allow exploding" check box
5. Click on the "Select Objects" button. The dialog box will disappear and you can select everything you have drawn by typing

```
All
Select objects: all          {type the word all}
Select objects:              {Press Enter}
```

6. Click on "OK"

Next we are going to write this block to a file so that we can add it to the drawings that we created. Type the command **wblock** and the "Write Block" dialog box shown on the right will appear.

1. Mark the "Block" radio button
2. Locate the block name for the block we have just created in the pull down list.
3. Check the path for the filename to make sure it is on your flash drive.
4. Make sure that the units are "Millimeters".
5. Click on OK.
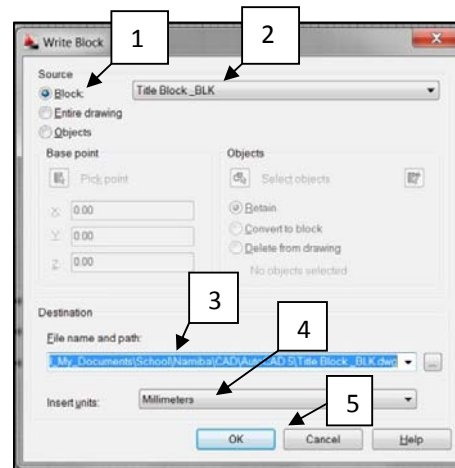
We are ready to insert this block into the drawings that we create. We can do that by inserting it into the startup file we created, "Startup_Drawing_A4".

Inserting the Title Block into a Drawing

Close the file you used to create the sheet borders and title block and open the start up file, "Startup_Drawing_A4". When it opens, click on the "Layout1" tab in the lower left corner of the window as shown on the right.
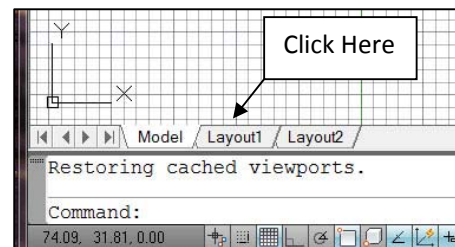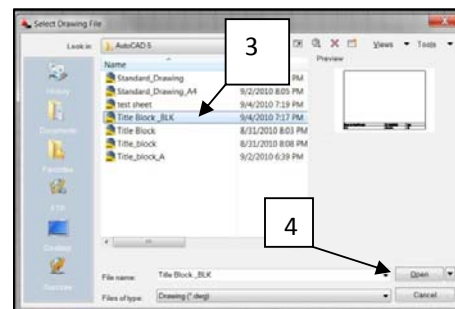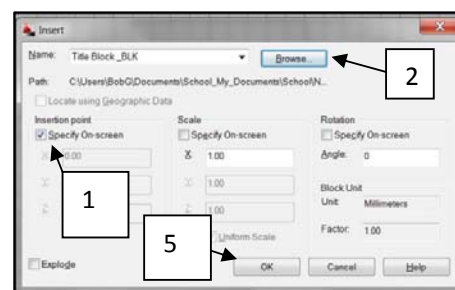
Next we insert the block containing the sheet page which we wrote as a file. Enter:

Insert

1. Make sure that "Specify on-screen" is marked
2. Click on "Browse" to find the block file

When you click on Browse, a dialog box will open allowing you to select the name of the block we created.

3. Click on the file name
4. Click on "Open" to open the file
5. Click on "OK" in the insert dialog box

AutoCAD will allow you to position the page borders and title block on the screen. Move the mouse until it is centered in the white area of the screen and click. The process is shown in the two figures below. The figure on the left shows the title block being moved and the figure on the right shows it positioned on the page.

Drag Corners to here

The gridded area is called the viewport. The drawings you create are shown in this view port. We need to adjust the size of the viewport. Click on the green border to produce the blue grips as shown in the figure on the right. Drag these grips to the corners of the drawing area as shown in the figure.

We are almost finished. When you create a drawing, you will want to add text to the title block. You will want to enter the correct date, the name of the part, and the sheet number. These things change with every drawing. At the moment, the title block is saved as a block, which is a single entity. Individual parts of the block cannot be edited. We need to explode the block before we edit it.

Enter:

Explode
```
Select objects:                    {Click on the title block}
Select objects:                    {Press Enter}
```

You can now change the text in the title block with the **ddedit** command. You will want to change the text for each new you create.

We have finished with the standard drawing file so you should save it. You might want to make several copies of it in case one of the copies gets lost or accidently used in a drawing.

Using the Standard Drawing File

When you use the standard sheet:

1. Open the standard drawing sheet "Startup_Drawing_A4".
2. Immediately use "Save As" to save the sheet using the name of the drawing you want to create
3. Click on the Model Tab and draw the part as usual. Note that all of the layers, linetypes, and other typical setup information have already been created for you.
4. When you are finished with the drawing, click on the "Layout1" tab to go to the layout page.
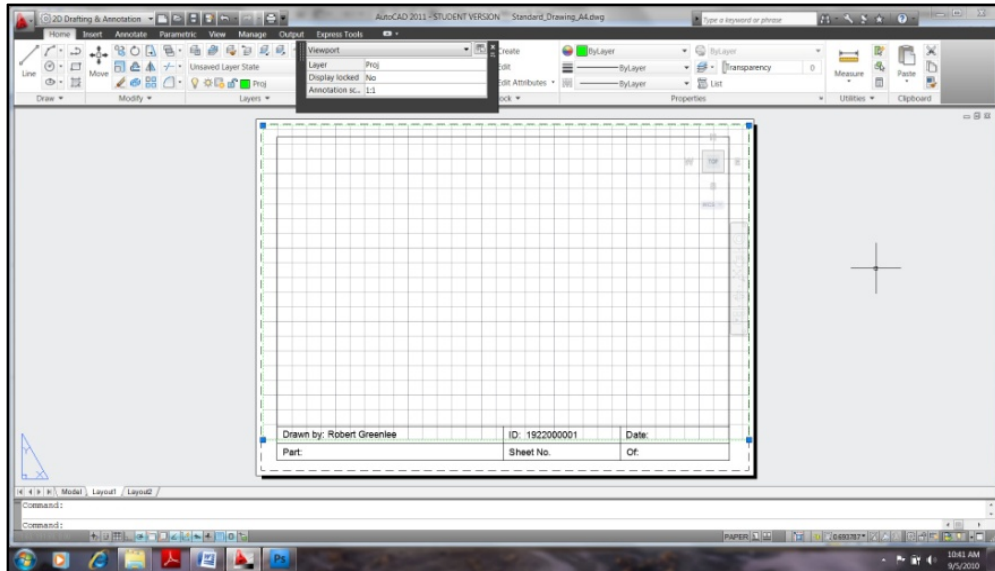
5. Click in the center of the graphics area until the green viewport border appears.
6. Use the command **zoom all** to bring the drawing into the viewport area.
7. Use the mouse to move the drawing around the viewport until it is properly positioned.
8. Use the **ddedit** command to edit the text in the title block.
9. Print the page when you have finished all of the changes. Your print should look like the sheet shown in the "Layout1" window.
10. Save all of your work.

Assignment

Go through this chapter and create the startup page described here. Once that is completed, draw problems 9.48 and 9.49 on the following page.