**Intro to Drafting & Design Fall 2016**

**Final Project & End of Semester Guidelines**:

Choose one of the following:

1. Design and fabricate a pin ball machine with working mechanisms. It must work, be fun to play and have a visually interesting theme!
2. Design and construct an architectural model (model of a house, interior spaces, or scale model of existing structure/building). Must be made to an architectural scale. Example: 1” =1’-0”
3. Design, modify, create, or engineer a product of your choice. Examples: cell phone speaker system, prosthetic hand, improved video game controller or kitchen tools….

Use the Design Process:

* Define your problem, brainstorm, make sketches, create test models, analyze/make improvements, and create final design/model/drawings.
	+ Who is your client or end user? Define its use or purpose.
	+ What materials or fabrication does it require?

Document your Process from start to finish:

* Keep all sketches, photograph study models of failures and successes, notes etc.

Required Products to be worked on in and outside of class:

* Process Documentation- sketches, study models, tests, notes, photos
* 3d Digital Model– part and assembly files of test models and/or final design

(Inventor, Homestyler, Revit, TinkerCAD).

* Physical Model – fabricate by hand or use the lasercutter and/or 3d printer to create scale model(s) of your design
* Final Technical Drawings- Multiview drawings of your part and assembly files or of your architectural structure. Include dimensions, scale, titleblock, and the following:
	+ Product teams: 3-6 views + Isometric for final assembly. 3-6 views + Isometric per part fabricated.
	+ Architecture teams: Front + left + right + back elevations + floor plan(s) + isometric interior and/or exterior views

PowerPoint – Email PPT to bolen.drafting.wheeler@gmail.com Thursday, December 15th.

Present on Friday, December 16th.

P1- Title page + team members’ names

P2- Description – sell your design, what is it? Define your client/end user. How does it work or get used? Why would we want to use it?

P3- How did you come up with your design? – include images of inspiration, existing products, research, etc. Why this type of product/structure?

P4- Show your design process documentation. Photos of steps along the way. Sketches, test models, etc. Successes and failures. How they informed design decisions.

P5- 3d Digital Model images and description of software used.

P5- Final Physical fabricated model photos. Describe how it was fabricated.

P6- Final Multiview Drawings

Final Project = 20% of overall grade

Final project product = 100 pts

Final project powerpoint = 100 pts.

Final project daily grade = 100 pts.

Final Exam: Included in 20% of Final Project Grade

* Review December 19
* Exam December 20 (1st block) 21 ( 3rd block)

Final Drawing + Final Inventor Files:

Please email final cell phone case, cell phone, and toy design model files and Multiview drawing files to bolen.drafting.wheeler@gmail.com

What we learned in class this semester:

Basic Hand Drafting

* Using Drafting equipment – triangles, T-square, architect and engineer scales, HB/4H pencils, etc.
* Multi-view Drawings of objects – Front, top, right views + oblique or isometric pictorials
* Title block + Scale (1:1, 1:2) + paper format (Type A, B, C, D…)

Autodesk AutoCAD 2013 Software + Laser Engraving/Cutting Paper and Plastics

* CADD – Computer aided drafting and design
* Multi-view Drawings of objects – Front, top, right views + oblique or isometric pictorials
* Title block + Scale (1:1, 1:2) + paper format (Type A, B, C, D…) + tags/annotation
* Using Model and Paper Space + Printing a drawing using 1:1 or architectural scale
* Origami Paper folded models of objects – blue engrave/fold, red cut
* Key Chain Design
* Difference between final dimensioned Multiview drawing vs. fabrication/tool path drawing

Autodesk Homestyler – Interior/Architecture Software

* Basic house floor plans with interior decoration, windows and doors at 1:1 scale
* 2D plan + 3D views of house design
* Scaled drawing of classroom - Hand drafted 1/8” = 1’-0”
* Scaled drawing of classroom - AutoCAD 1/8” = 1’-0”

Autodesk Inventor 2013 – 3d Parametric Modeling Software + 3d Printing

* Basic 3d modeling of multiple objects with slopes, square and round holes,
* Part files vs. Assembly Files vs. Drawing Files
* Designing a building toy – 3D printing and tolerances (inches) STL files
* Reading a complex technical drawing + modeling cell phone (metric)
* Designing a cell phone case + 3d printing + revising and editing case and/or toy design
* Setting up a title block, scale, and Multiview drawings of parts or assembly files
* Multi-view Drawings of objects – Front, top, right, left and back views + isometric pictorial
* Annotation: dimensions (diameter, radius, etc.), centerlines