Name_____ Date_____

Introduction to Engineering CAD

Course Guidelines and Goals

ericbrunelle@bpsma.org

Course Description

Engineers and technologists are people who use science and math to create things that advance society. This course will introduce you to the Design Process using ProENGINEER CAD software. During this course, you will learn to create components and multi-part assemblies of ***consumer products and mechanical devices*** using the premier solid modeling tool used by industry leaders such as Boeing, Airbus, Braun, Dell, Palm, Grohe, Nike, Audi, Motorola, and many more**.** Hopefully, you come away from this course inspired to look at careers in 3D design.

The course is divides into two parts. First, you will learn the skills necessary to hand sketch designs. We will practice hand sketching throughout the semester. Second, you will display proficiency in the basic operations of ProENGINEER CAD software. You will further develop your proficiency in ProDESKTOP by creating multi-part designs of ***your choosing***. You will use the Design Process to create your designs.

By the end of this course, you will be able to:

1. ***Conceptualize*** and ***draw*** designs using orthographic, isometric and trimetric (opaque) views.
2. Use the necessary ***literacy skills*** to convey design ideas to your teacher and classmates.
3. Be able to ***communicate*** your design ideas using the vocabulary and terminology of design drawing and CAD.
4. Identify the components of the Design Process in a work in progress.
5. Apply the Design Process to a mechanical engineering problem.
6. Be able to display proficiency in the basic elements of ProENGINEER software.
7. Use proper naming techniques to convey unique characteristics of a design.
8. Troubleshoot 3-D feature, sketch, and assembly issues using the Browser window.

Responsibilities

1. Be on time – if you are late for class, it will be noted and reported (demerits).
2. Respect – you must be respectful at all times.
   Respect means:
   - No swearing or inappropriate language
   - No talking while another person is talking
   - No interrupting another person while they are working
   - No heads on desks
   - Raise your hand for help or questions
3. Have your assignments completed on time – ***NO EXCUSES!!***

What to bring to Class

1. Notebook – in a three-ring binder or separate notebook ***for this class.***
2. Pencils – bring more than one. Why?
3. A Flash Drive – if you "lose" your work, you will have to re-do it.
4. A great attitude!

Grading

Projects, Homework, Quizzes and Tests are graded on a point system. Some are worth 10 points; some are worth 100 points, depending on the importance and amount of material covered in the assignment.

- Projects – 45%
- Class Participation: 15%
- Homework/quizzes: 15%
- Tests: 25%

Projects

Digital projects must use the filename formula ***nameINL_CL_period***, where "name" is the project name (e.g. lego), INL is your initials, CL is the course abbreviation (e.g. PE), and period is the period of the day. ***THERE WILL BE AN AUTOMATIC 10% PENALTY IF THIS IS NOT DONE CORRECTLY!***

All component parts (with some exceptions – this will be clear for each assignment) must have your name on them in a discreet location to identify them as yours. If your name is not on a part, it will be graded as a "zero"

Homework will be accepted on the due date ***ONLY***. Half credit can be earned if the assignment is turned in after school. If you are absent on the day homework is due, it is your responsibility to turn in your homework on the next class day that you are in school.

Missed **quizzes** and **tests** must be made up within two days of returning to school, unless there are extenuating circumstances and approval of Mr. Brunelle.

I have read and understand the course expectations:

_____ _____

Student Parent/Guardian

Course Sequence:

Day	Activity	Description
1	Your Expectations	Pre-course Discusion – what do you think CAD is? How is it used? What is Mechanical Drawing • Portfolio folders, course requirements and expectations • License agreements • Class Rules • Homework – Read "A Short History of Design and Technology", answer questions.
2	The Design Process	Return License agreements, Video – The Deep Dive – Complete viewing guide. • Be able to diagram the Design Process • Be able to connect the activities in the Deep Dive to the design process. • Homework – The Deep Dive Reflection
3	Intro to ProD	The ProD environment, begin the Lego, then the Toy Block. • Create a quiz study guide • Create folders • Naming files • Naming sketches and features • Labeling/Constraining sketches • Setting Units • Define Extrusion, projection, Text tool, constraints, weak dimensions, shell solids, round tool Pass in homework, review. Homework – Read "A Short History of Design and Technology", answer questions.
4	Intro to ProD - finish	Complete both designs and post on engrade? If finished, start the Ring for Extra Credit • Naming files • Naming sketches, workplanes and features • Define extrusion, projection, text tool, constraints, weak dimensions, shell solids, round tool Homework – Read "Introduction" – answer questions
5	Assemblies - VAN	Begin the Van Assembly tutorial. • Assembly constraints – center axis, mate, align, offset. • Naming assembly constraints, selecting parts, component relationships • Quiz review
6	Assemblies - finish	Quiz – then Finish the Van Assembly tutorial • Create an Album • Export a "jpeg" Post ALL FILES Extensions – Start using Google Sketchup

7	Generating Drawings	Generate orthographic drawings from the 3-D model that you have created • Orthographic labels • Importing Sketch Dimensions • Tables
8	Generating Drawings - Finish	Print Drawings • Proof before printing!! • Print Setup • Order • Test 1 Review
9	Test 1, Start Clock	25 minutes for test, Start Clock Tutorial • "Duplicate" procedure • Advanced maneuvering of 3-D models • Customizing a packaged design
10	Clock Assembly	Finish Clock Face, customize. Start Assembly • Finish assembly • Create an album • Export a JPG
11	Clock Drawings	Create and Print Drawings • Page Setup • Labels, import dimensions • Section View
12	Clock Animations	Create an Animation of your Clock in Motion • Export in 4 different formats • Post ALL FILES onto Moodle
13	Eye Glasses (PROBABLY NOT – DO A VARIETY OF DESIGNS AFTER THE BOTTLE)	
	Quiz #2, Start Sports Drink Bottle	10 minutes for quiz, start Sports Drink Bottle project. Go over Design Brief, Start Research, start Design brief. Homework – Finish Design Brief, prepare presentation (1-2 minutes, using notecards and Blackboard) – Due on class #14 (Design Brief and Note Cards)
	Present your project ideas	Use Blackboard and Notes to outline your research, and present your intended solutions. Teacher Demo of Some ideas and ways to develop them with ProDESKTOP

15	PowerPoint assignment	Create a PowerPoint that shows the development of your design. Include Screen shots of the Challenges that you faced, how you overcame them. After reviewing the assignment, students can start using ProD to create their Bottles.
16	Work on Bottles	Practice Bottles – Extrusion and Revolve • Shelling challenges • Neck and cap issues • Threaded screw