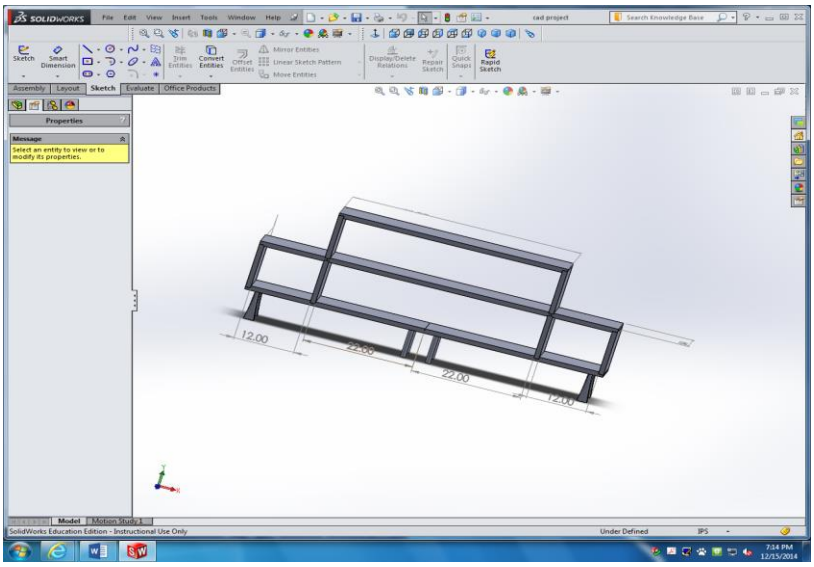
John Schappe's Design Portfolio

Xinli Wu

EDSGN 100

Section 010



Submitted by jts5595@psu.edu

Submitted to Xinli@psu.edu

December 15, 2014

This webpage serves as a link to display the culmination of SolidWorks exercises, two design projects, and other graphics I have completed in Xinli's EDSGN 100 class. The purpose of this portfolio is to highlight the accomplishments I have made in EDSGN 100 this semester.

Table of Contents

John Schappe

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University Address:

0327 Bigler

University Park, PA 16802

Home Address:

9 Blackmore Court

Camp Hill Pa, 17011

Objective:

- To obtain an internship with a prestigious company as a mechanical engineer for summer 2015.

Education:

The Pennsylvania State University, University Park, PA

Bachelor's Degree in Mechanical Engineering, College of Engineering, (August 2014-May 2018)

Current Relevant Courses:

Calculus, Chemistry, Macroeconomics, Engineering Design (Solidworks and Excel applications)

Work Experience:

- The Pizza Grille Inc., Camp Hill, PA: Host/ bus boy (July 2012-present)
  - Assisted customers directly when addressing concerns and complaints
  - Developed communication and problem solving skills
- 6 Blackmore Court (residence) (July 2012-present)
  - Removed and replaced a 14x18 ft. outdoor deck
  - Resealed the house foundation and refilled the concrete walkway
  - Experienced hands on instruction from a professional engineer
- Current Activities/Clubs
  - Engineers for a Sustainable World, Intramural Volleyball, Sigma Phi Epsilon Fraternity

Syllabus

KINES 189

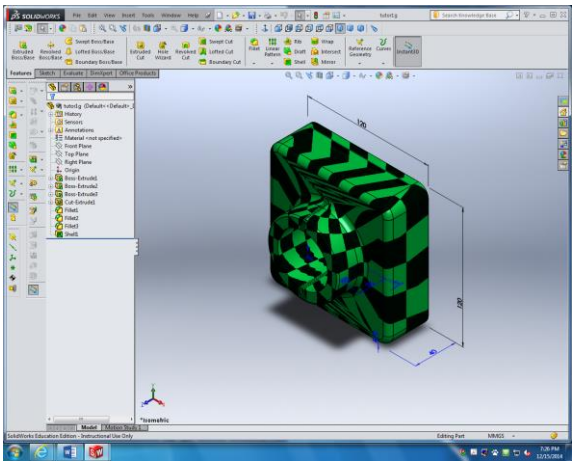
CHEM 110

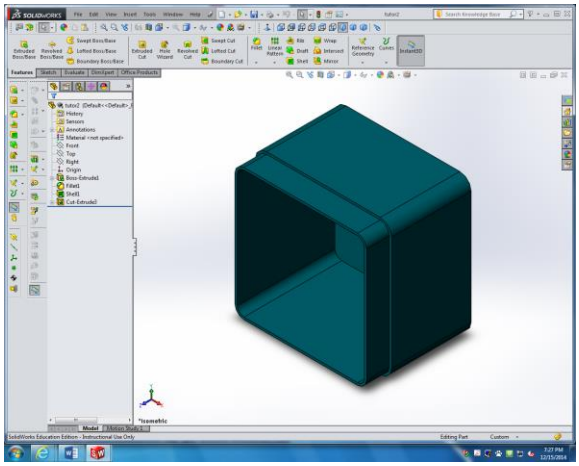
MATH 140E

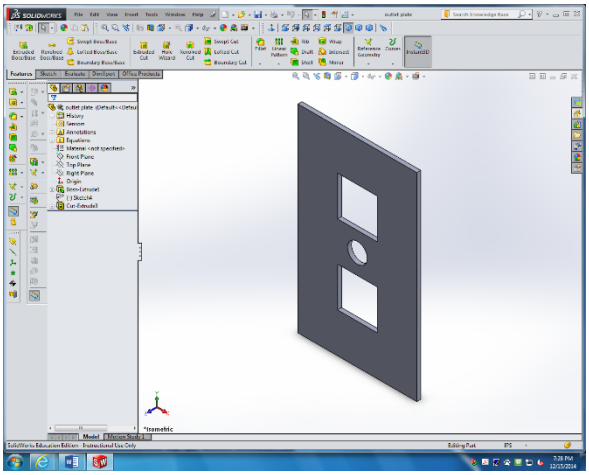
EDSGN 100

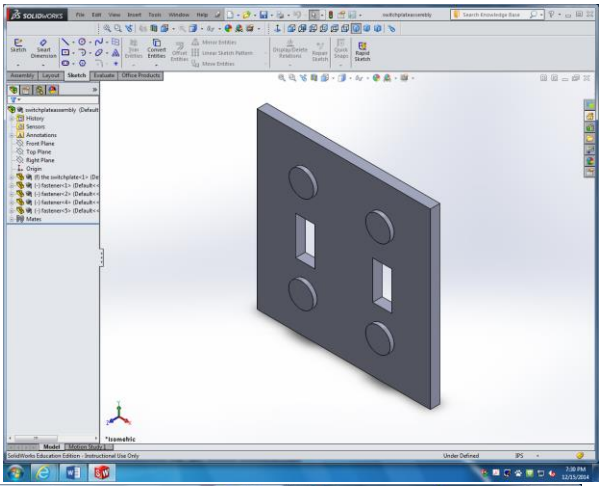
E SC 097S (freshmen engineering seminar)

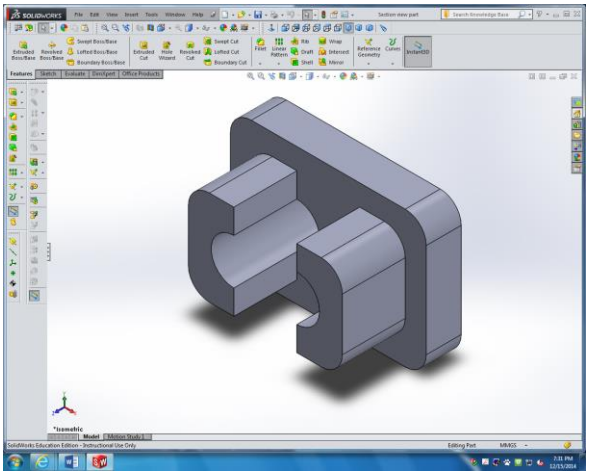
Assemblies and Parts

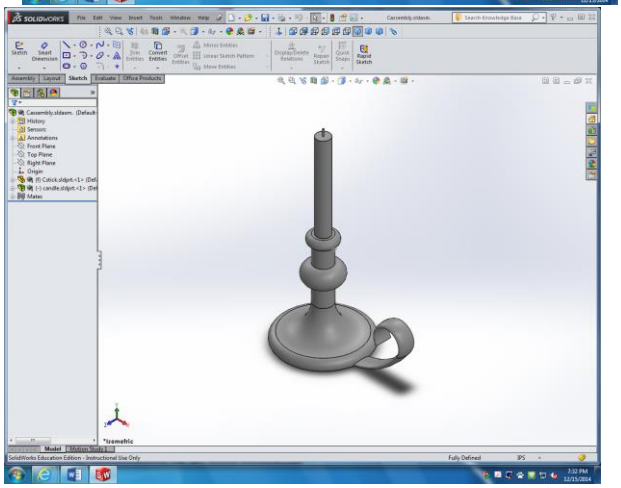




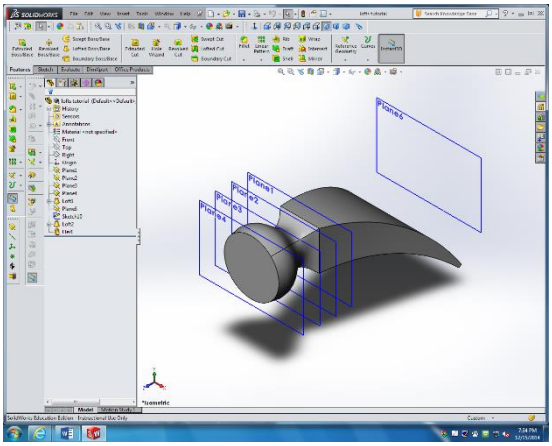


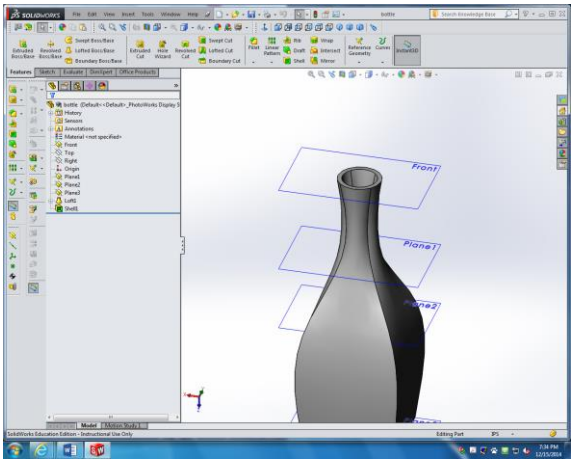


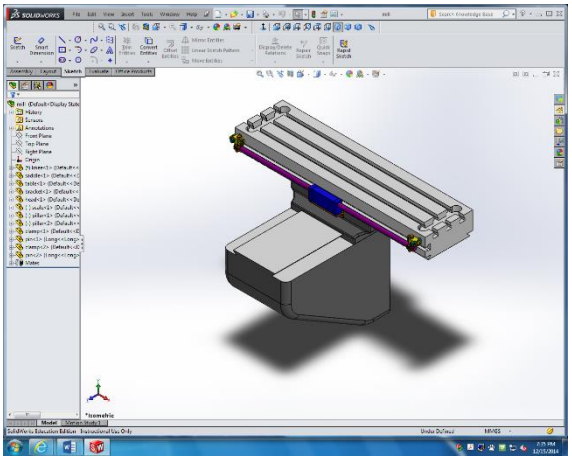


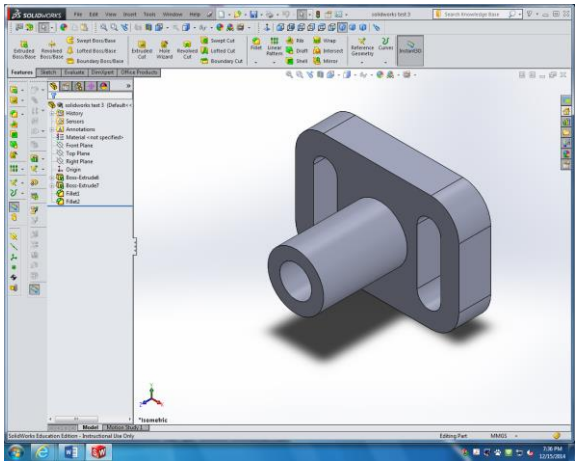


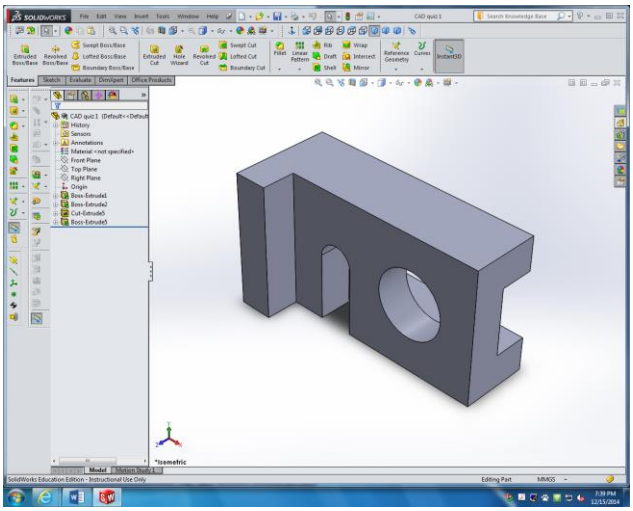
Lofts and Assemblies

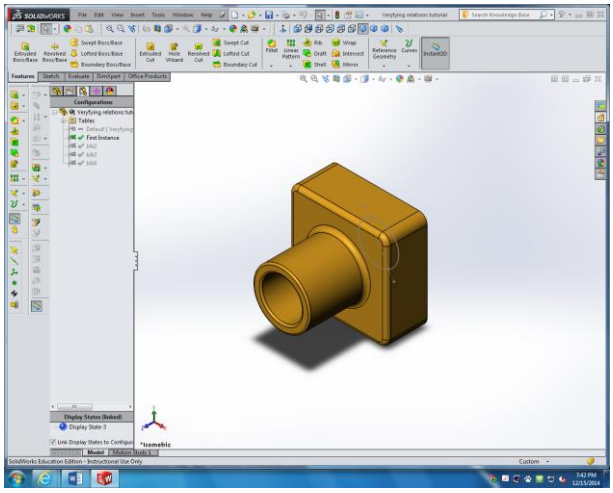




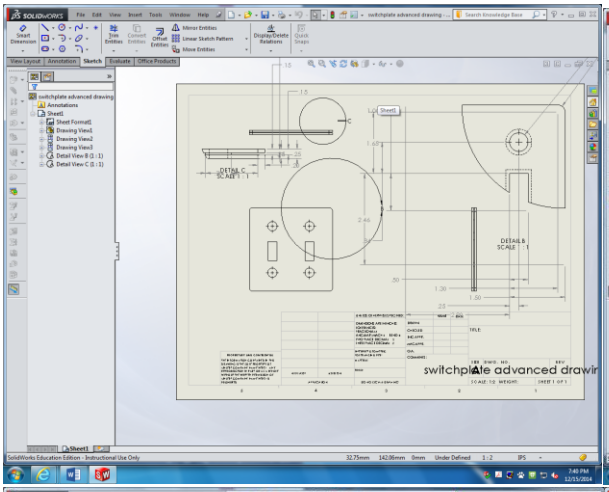


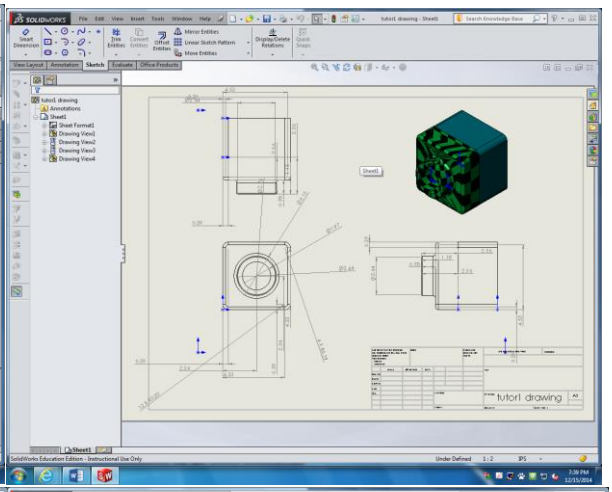


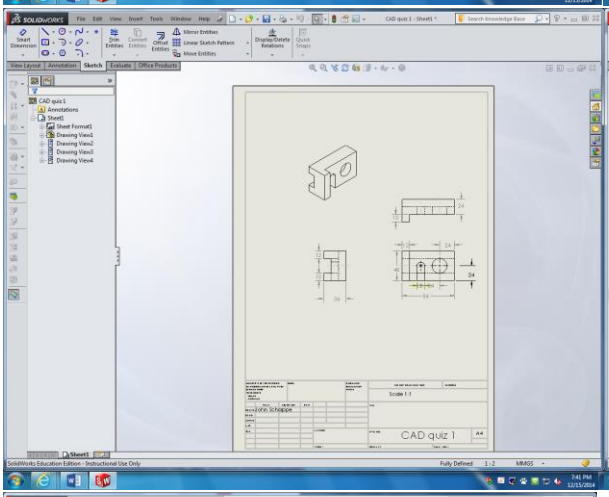


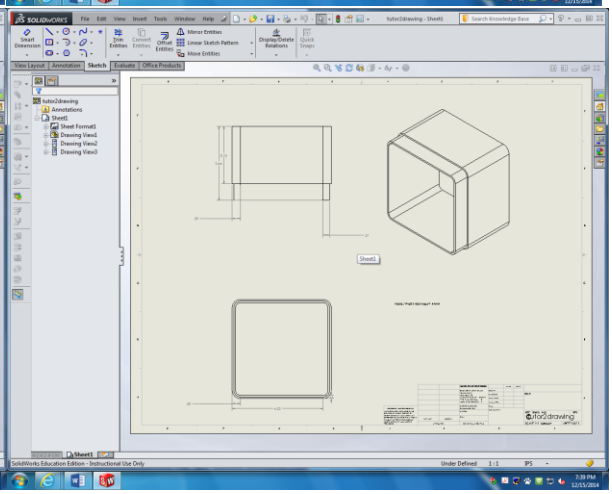


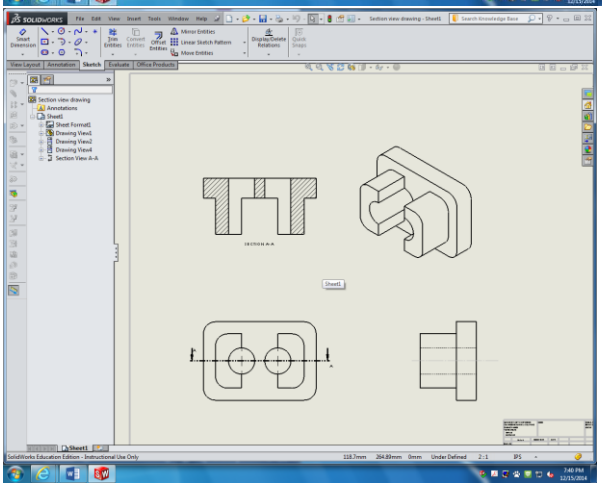
Drawings











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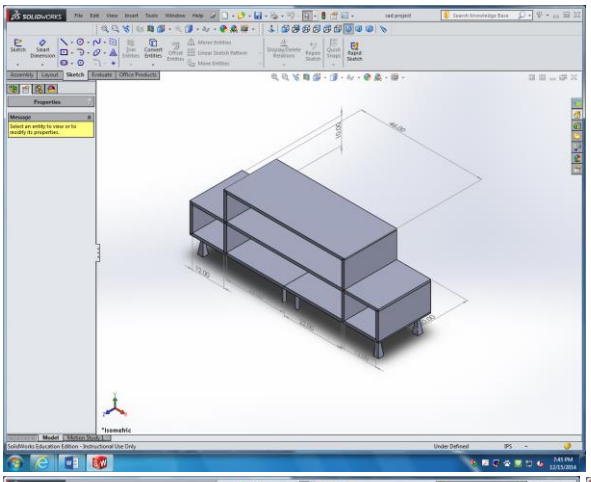

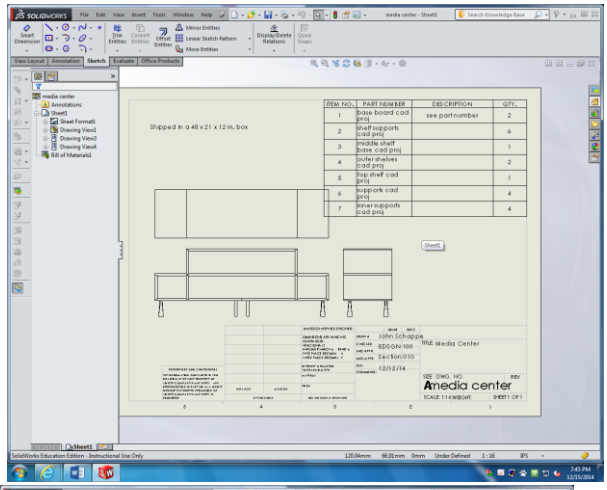
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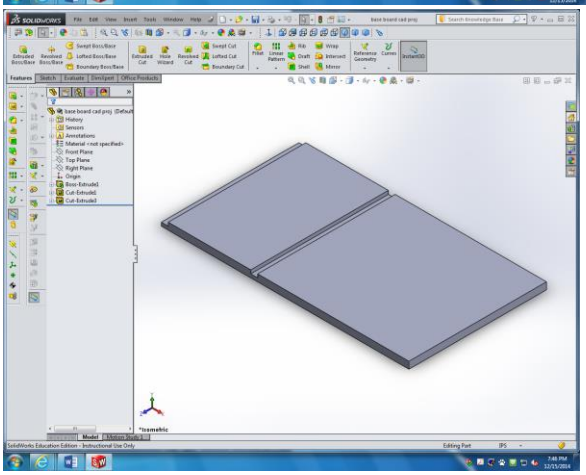

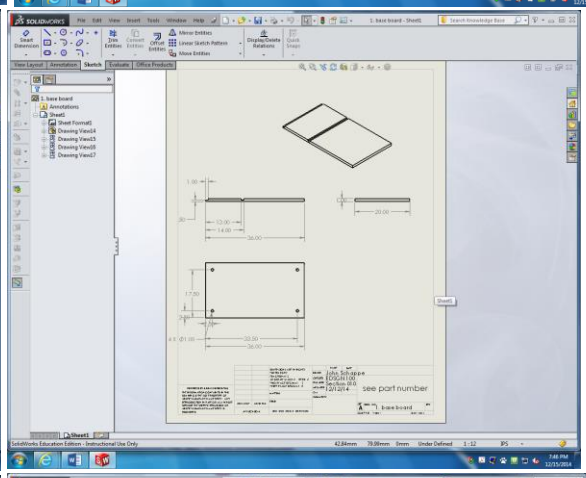
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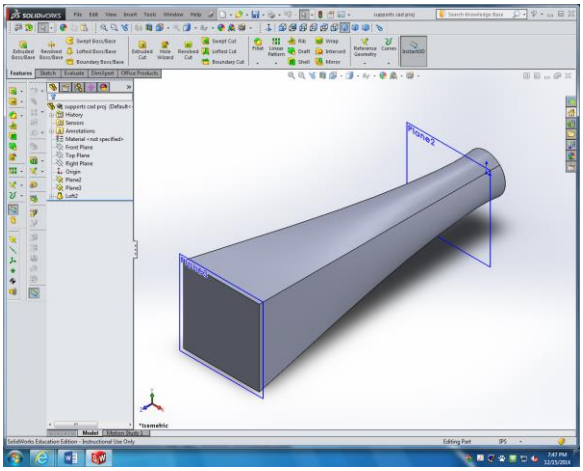
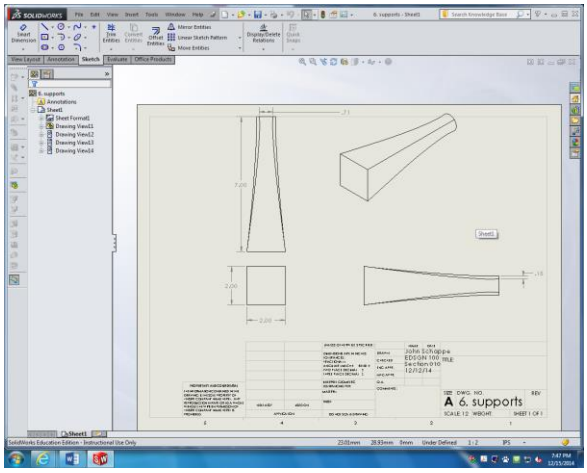



A 6. supports

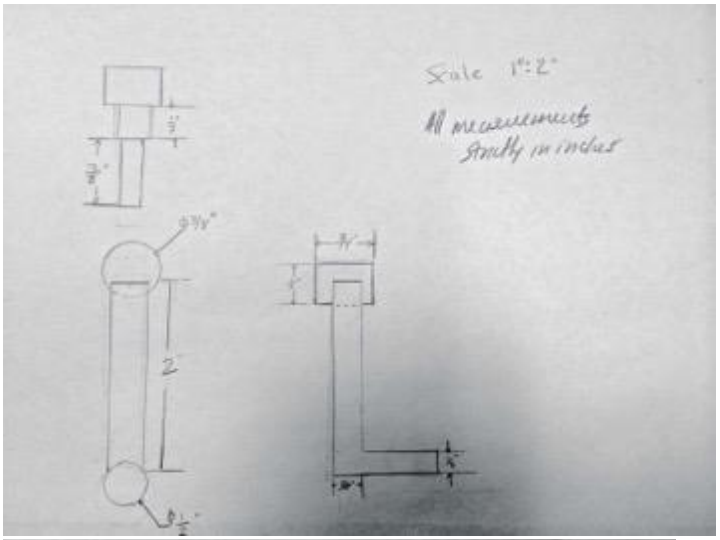
First Design Project

(I.) Problem Statement
Available models of dumpling makers did not produce the desired amount of dumplings in an economical timeframe. Pre-existing units also tend to be large and expensive, often making them impractical or financially infeasible.

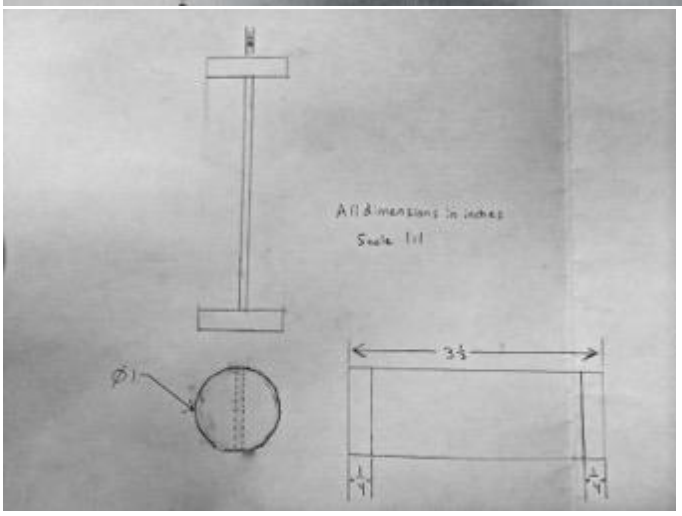
(II.) Mission Statement
The mission was to design and build a model of dumpling maker that would produce more dumplings in a shorter timeframe, while also creating a design which would match the expectations of the majority of consumers.

(III.) Specifications
In the implemented design there are two sets of rollers. Each aluminum roller is six inches in length with a diameter of 1 ⅜". Between the rollers is a space to place the filling. In the middle of the filling space is a 2"x1" rectangular hole. Directly under the hole are two steel gears with 32 teeth and a pitch diameter of 1". The rollers and gears will rotate simultaneously. The now flattened dough would then be directed underneath the gears and the edges of the dough will be pinched together by two pieces of metal to shape the dumplings. The now shaped and filled dumplings are then pushed through a slot in the front. The dumplings can now be easily separated and cooked.

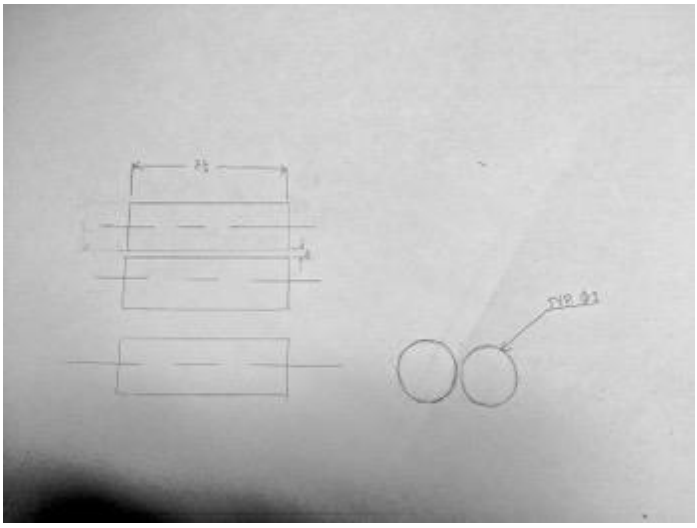
Detail Drawings



Hand Crank



Crimpers



Rollers

Features

A. Manually Operated Crank

B. Dough Containment Unit

C. Filling Containment Unit

D. Spring & Spring Operated Filling Dispenser

E. Dough Rolling Mechanisms

F. Crimping Mechanisms

G. Gear System

H. Exit Ramp & Slot

Second Design Report

A. Problem Statement

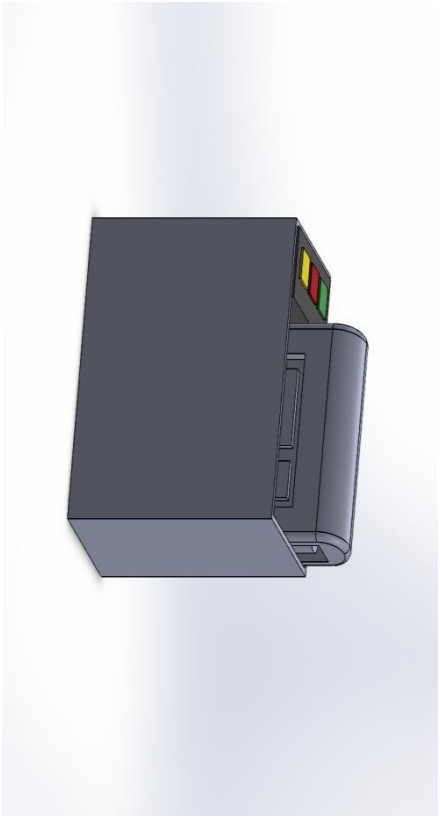
There was not an existing system in place for monitoring alcohol levels of the people operating motor vehicles. Intoxicated drivers are a hazard and have caused the deaths of thousands of innocent people.

B. Mission Statement

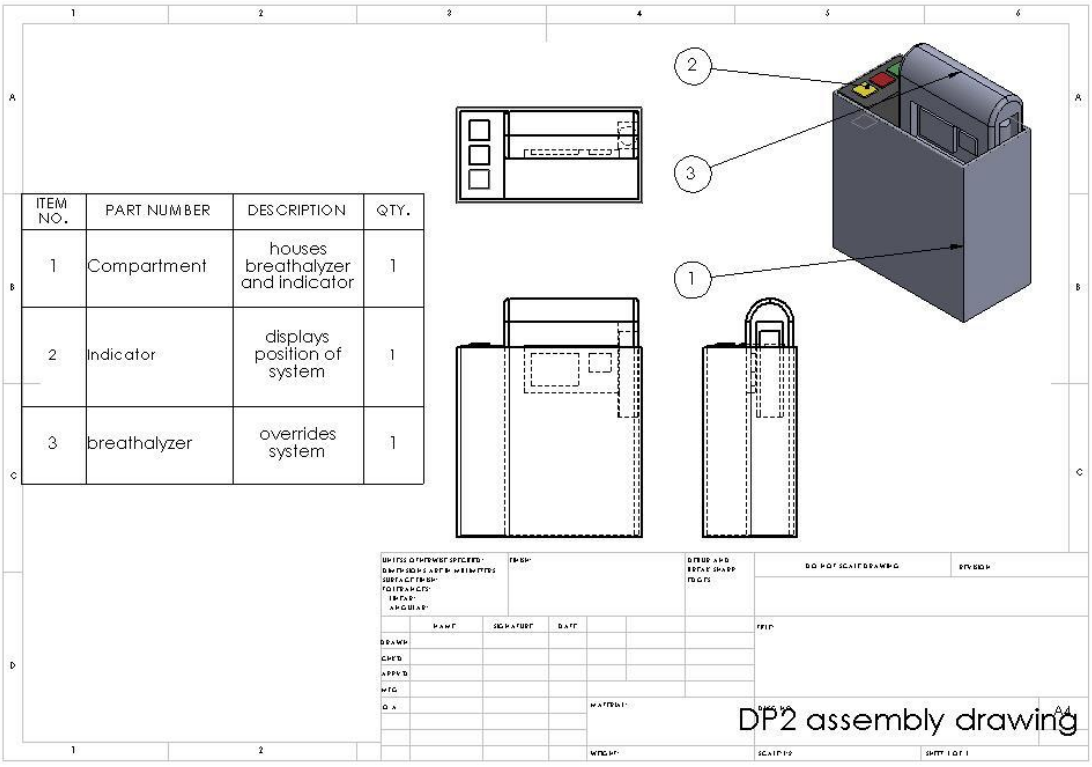
a. The mission was to design and build a model of a device that, mounted in cars, would hinder a person's ability to operate their vehicle and bring an intoxicated driver to the attention of local law enforcement so the legal action can be taken to keep innocent people safe.

C. Design Specifications

a. In the implemented design there are many sensors located within the vehicle that are designed to measure the Blood Alcohol Content of the driver and the passengers within the vehicle. If there is alcohol detected and the driver is not under the influence he or she is then able to perform and override function by taking an included breathalyzer and then he or she will be able to continue driving. If high levels of alcohol are detected a driver does not perform the override function then the driver will be instructed to pull over and if he or she does not pull over the local law enforcement will be notified.

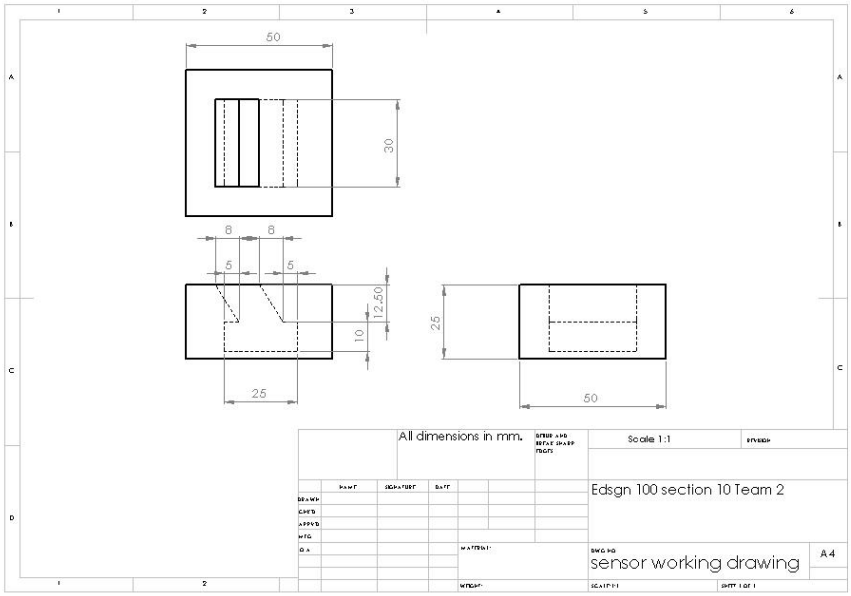


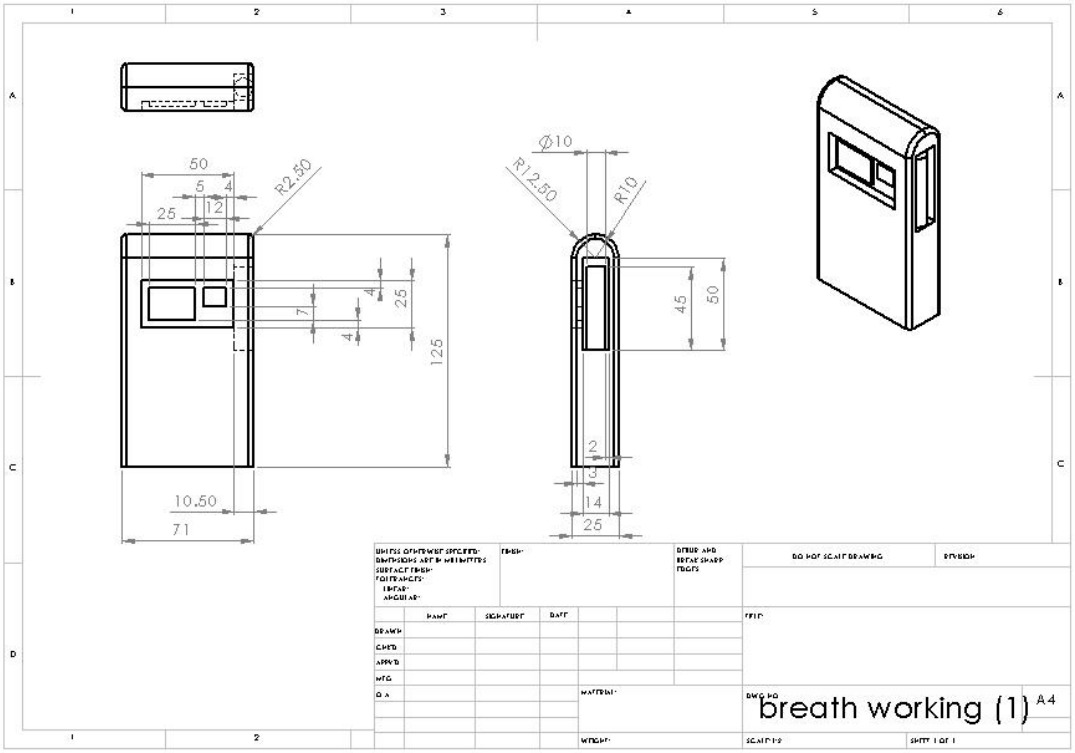
Assembly Drawing



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Compartment	houses breathalyzer and indicator	1
2	Indicator	displays position of system	1
3	breathalyzer	overrides system	1

Detail Drawings





Design Features

Concept of Operations

a. The proposed system will be a passive breathalyzer test with an override ability. It will run off of the vehicles power supply and will be activated whenever the vehicle is turned on. The various sensors within the car should analyze the air within one minute and assess whether a drunk person is in the vehicle. If someone is detected, the driver must pull over if they have already started driving and perform an override procedure to prove they are not the person that is drunk and will allow them to drive without further notification until the vehicle is turned off. If no person is determined to be drunk, the system will periodically check the air throughout the drive, and if there is a detected drunk person in the vehicle during the drive, the driver will have a few minutes to pull over and perform the same override. If at any time the system detects a drunk person but the driver does not perform the override, the police will be notified of a potential drunk driver. The passive system is comprised of air vents throughout the car, and the active override is a hand held breathalyzer that is in a compartment to the left of the steering wheel to dissuade anyone besides the driver from performing the override.

(III.) Life Cycle Analysis

a. Raw Materials

i. Breathalyzer - Uses a chemical reaction involving alcohol that produces a color change

b. Manufacturing

i. The Breathalyzer air analysis system will be standard in all car designs

c. Packaging

i. The air analysis system will be housed in the dashboard of the vehicle, as well as over the drivers head (overhead roof sensors)

d. Marketing

i. By using the breath analysis system the team can market the car as a much safer vehicle, which reduces incidences of drunk driving related accidents

ii. The device could also be sold to pre-existing car-makers by using the increased safety as a selling point

e. Maintenance

i. This product would need only to be checked when the vehicle is being regularly inspected.

f. Waste/Recyclability

i. This device produces virtually no waste and would not need to be replaced unless it was broken and it is likely that that would only happen as a result of an accident.

ii. It is unlikely that this product would be moved from one vehicle to another and recycled.

(IV.) Assessment of important aspects of your system for feasibility and adoption

a. The design has many aspects that makes it easy to implement into new models of vehicles. The sensors connected with the system would be imbedded into various areas of the car where either nothing is currently located or connected with the ventilation system of the car. All sensors would be wired or wirelessly connected to the control panel which would be imbedded as part of the center console in the car. For normal driving conditions, this design would have no impact to the driver and would only interact with the driver when it sensed someone drunk was in the vehicle.

(V.) Economic viability of the system

a. The design system would be easy to implement into new vehicles because it only requires a different design layout of the center console and dashboard. Costs would only include the price of the design and reshaping those car features. The whole system is relatively cost effective and is an applicable system to add to vehicles.

Summary

EDSGN 100 was a challenging course that forced me to think creatively as well as work diligently. The skills I learned in SolidWorks and more importantly the group working skills I developed will be a great help to me in the future.

Acknowledgements

I would like to thank Xinli Wu for being a great EDSGN 100 teacher. His drawing skills and engineering knowledge greatly impressed me. More than that, his teaching skills and desire to help his students learn.