

Engineering Presentation

By Sagar Garg

Courses

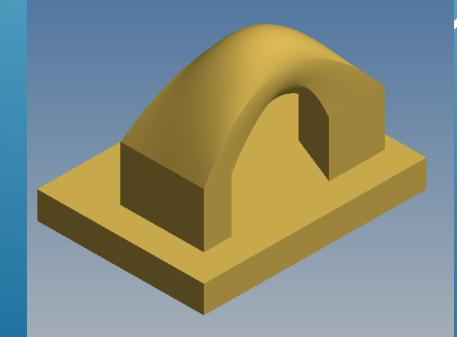
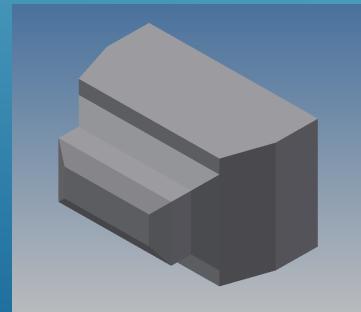
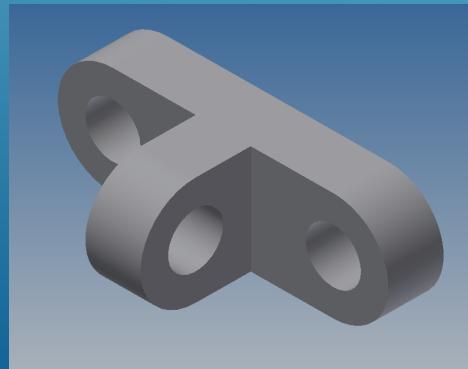
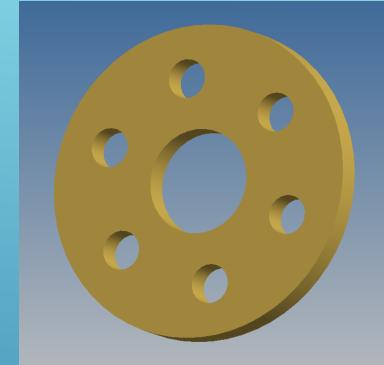
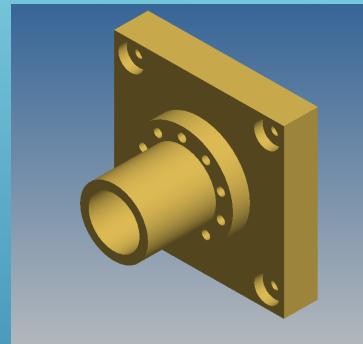
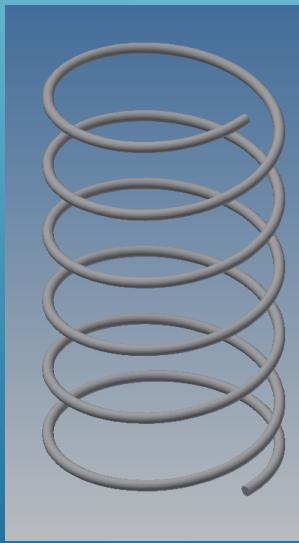
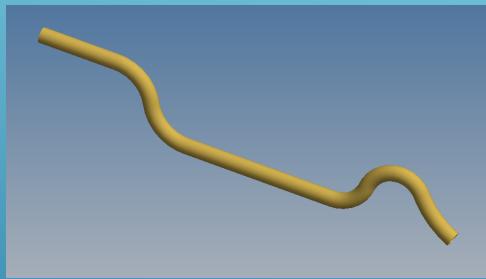
- Introduction to Engineering Design I
- Digital Electronics
- Engineering Technology
- Introduction to Engineering Design II
- Principles of Engineering
- Manufacture Process CIM
- Intermediate Electrical Engineering

Introduction to Engineering Design I

- AutoDesk Inventor 2D skills
- AutoDesk Inventor 3D skills
- Designing Lego Figures
- Final Year Project

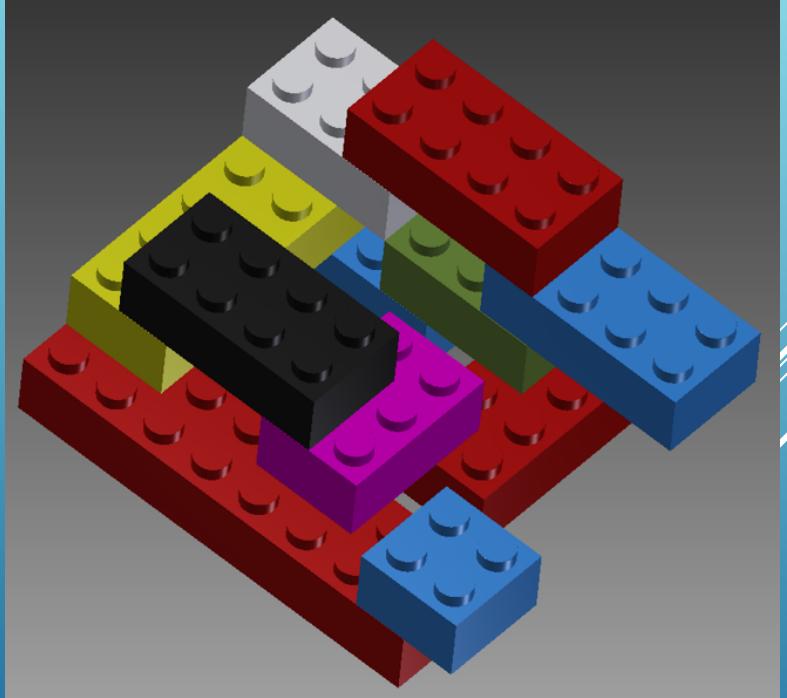


AutoDesk Inventor 2D and 3D skills



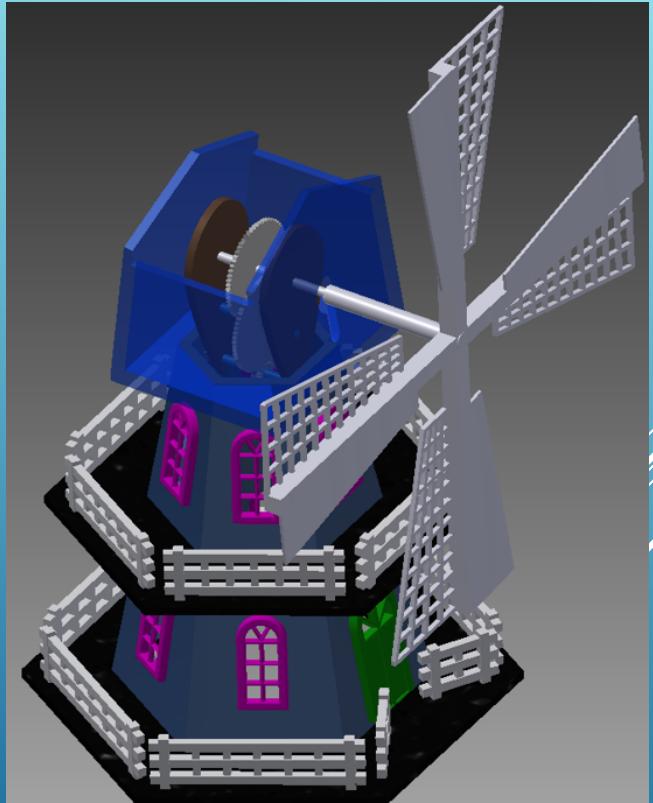
Lego Design

- Learned how to create 3D designs
- Learned how to constrain parts
- Created an assembly and animation



Final Year Project

- Design a windmill
- Created an Assembly and Animation



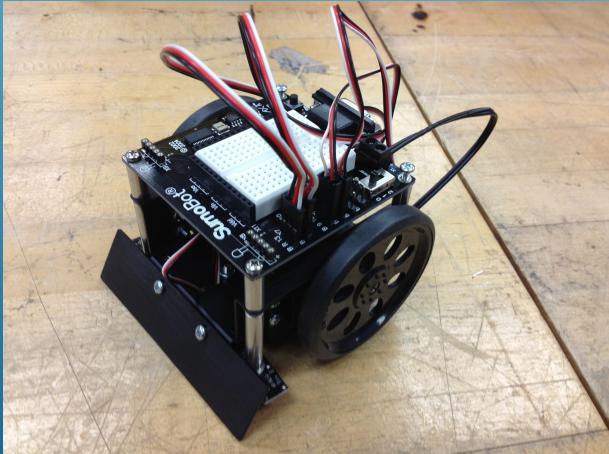
Digital Electronics

- Learned basic electronics
- Breadboard circuitry
- Soldering
- Christmas Tree Project



Digital Electronics

- Christmas tree project - Learned to Solder on a circuit board
- Breadboard arduino servo project

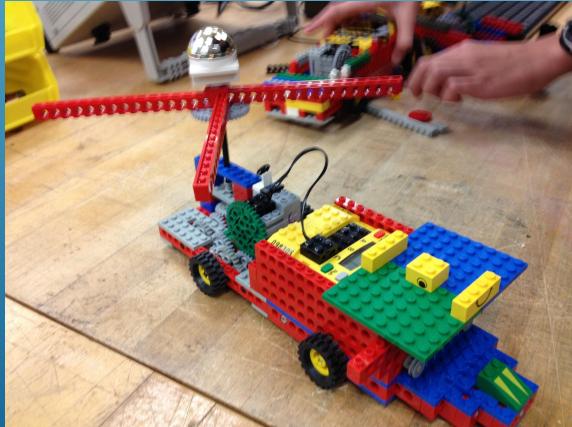


Engineering Technology

- History of Computers
- Various parts of a computer
- Networking
- Engineering Safety
- Laser Printing
- Robotics Engineering Project

Engineering Technology

- Deconstructed computer to identify different parts
- Constructed a remote control robot similar

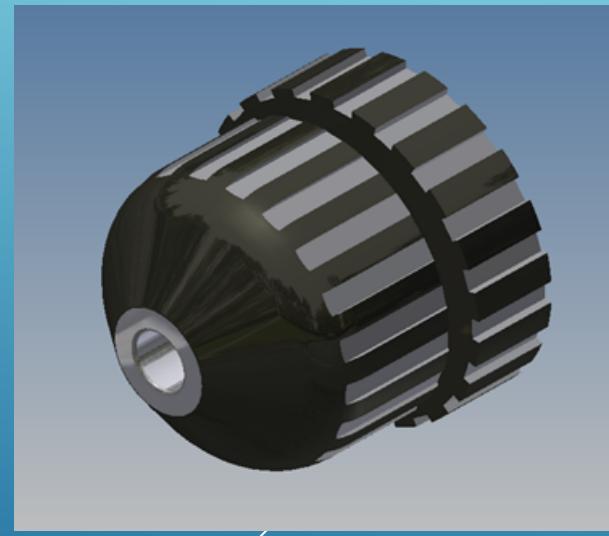
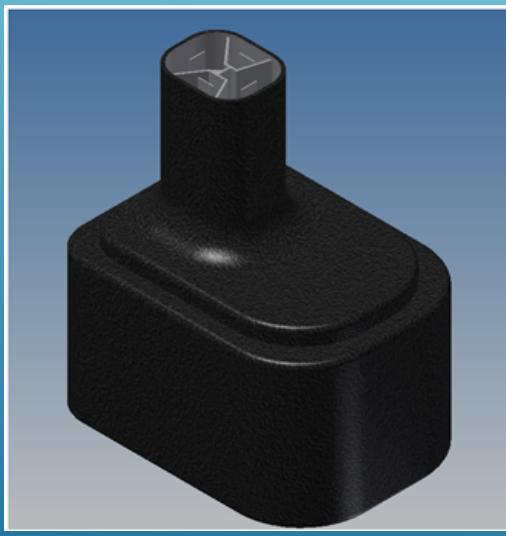
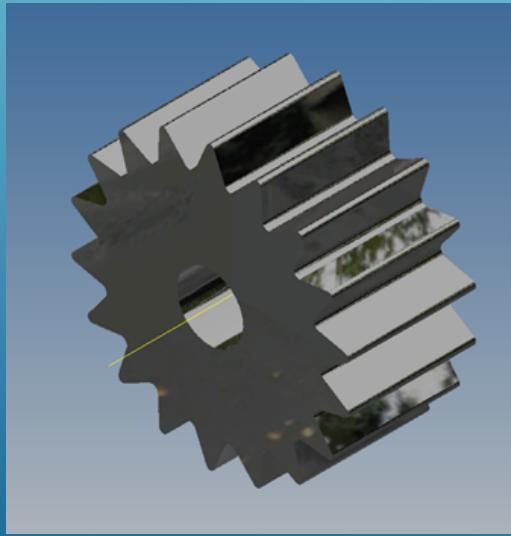


Introduction to Engineering Design II

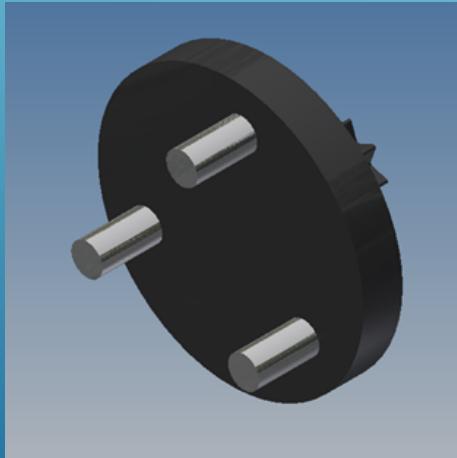
- Reverse Engineering Project
- Electric Drill



Major Parts



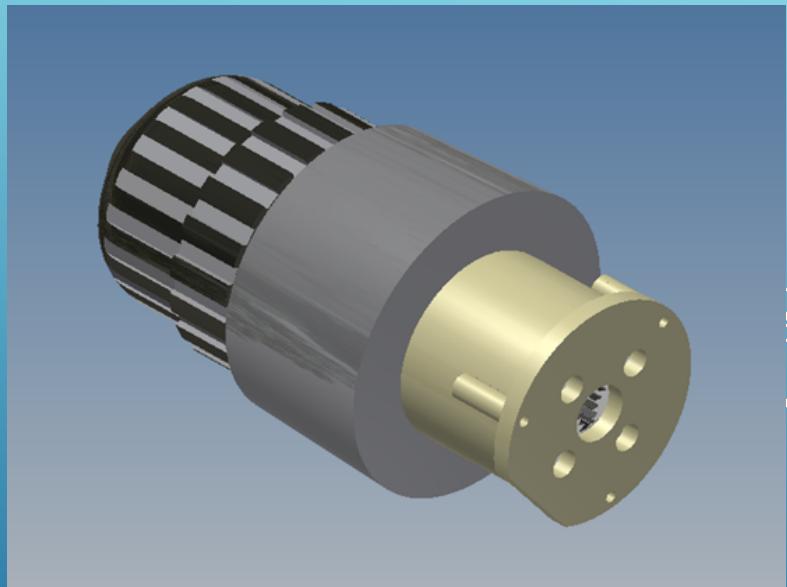
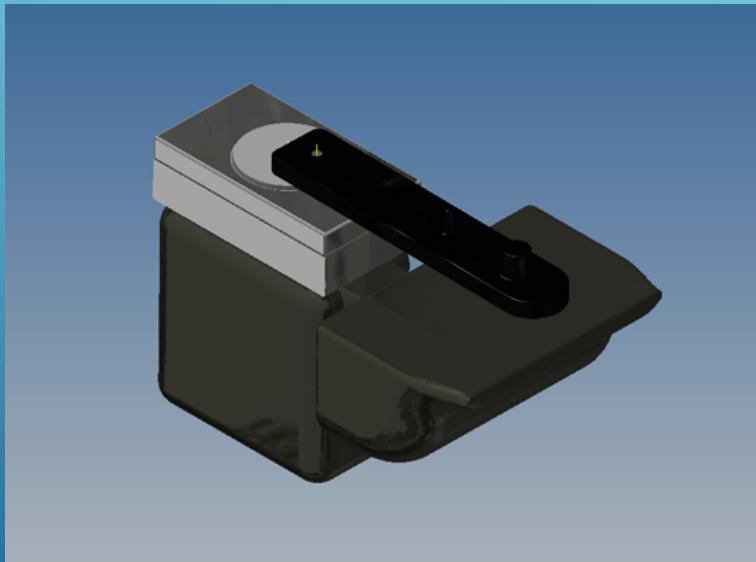
Major Parts



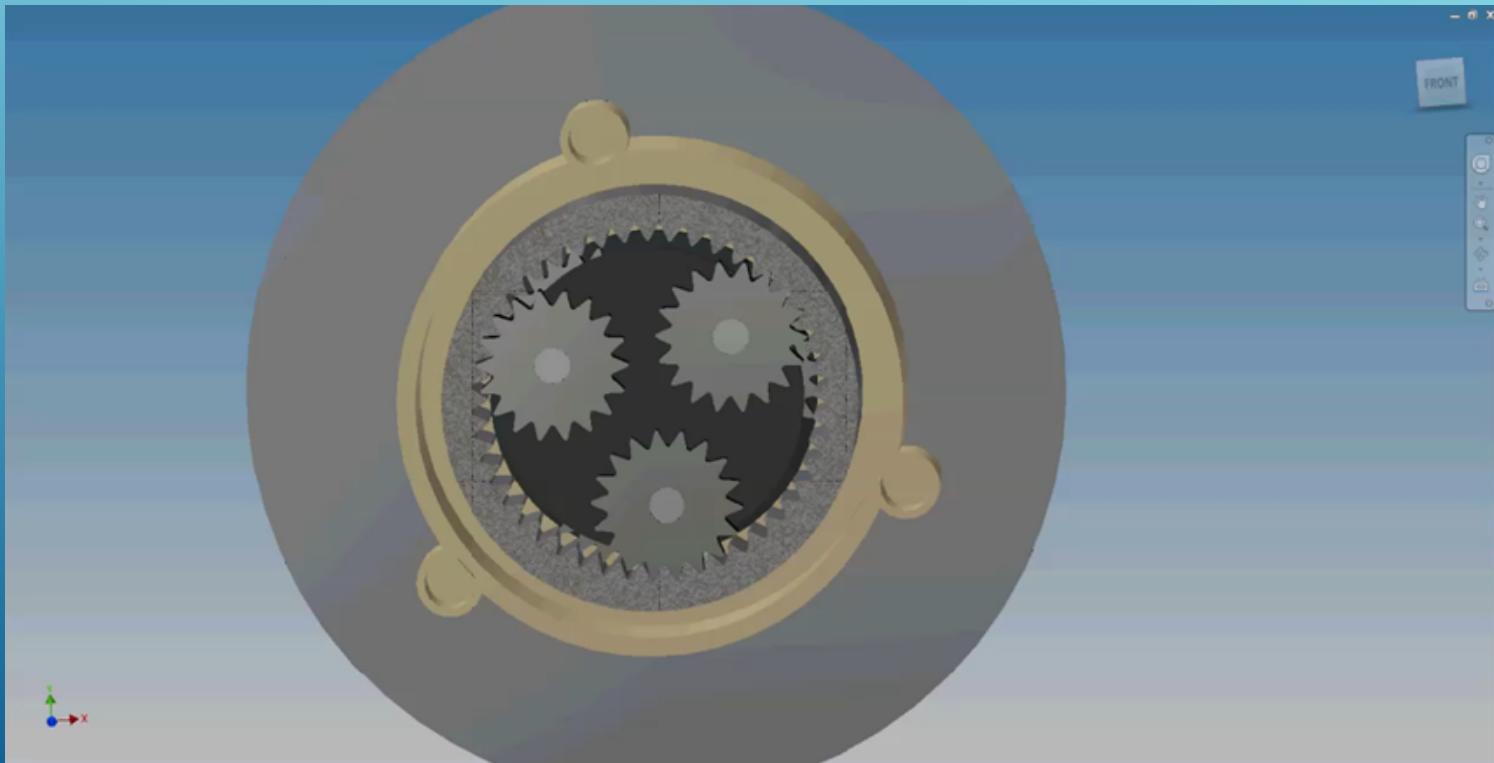
Major Parts



Assemblies



Gear Assembly



Final Project



Principle of Engineering

- Bridge Truss Problems
- Stress and Strain
- Bridge Project
- Tensile Strength Project
- Started Arduino Programming



Principle of Engineering

- Bridge Truss
- Tensile Strength

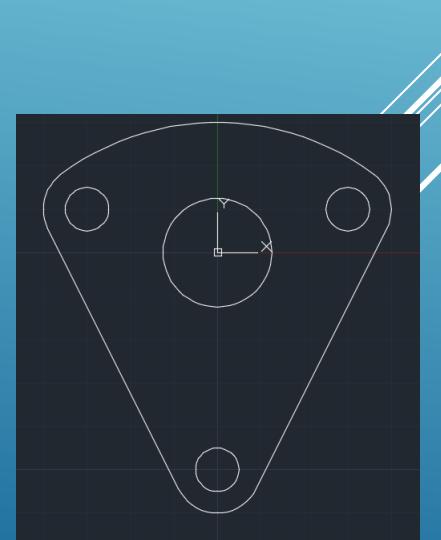
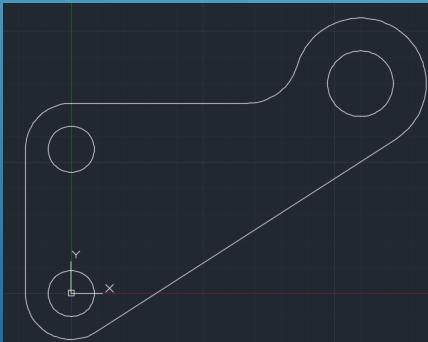
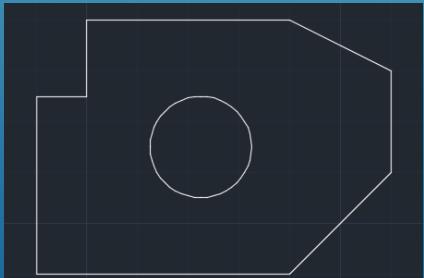
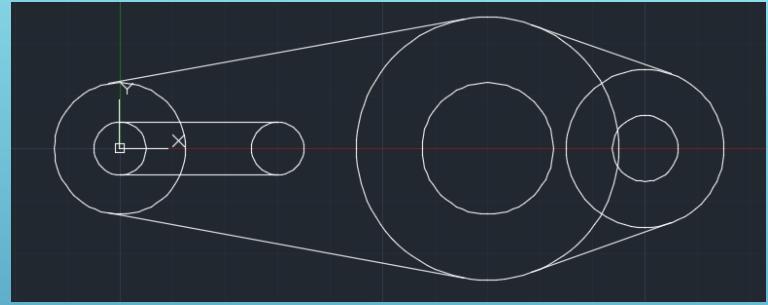
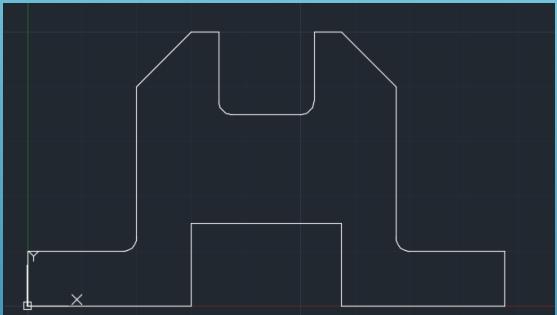
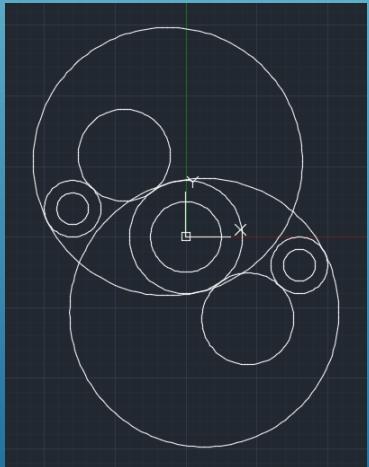


Manufacturing Process CIM

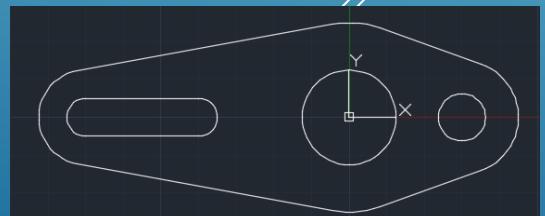
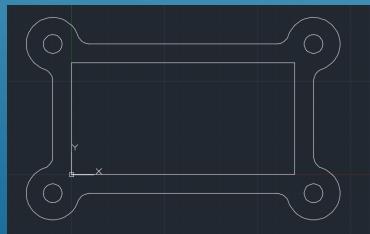
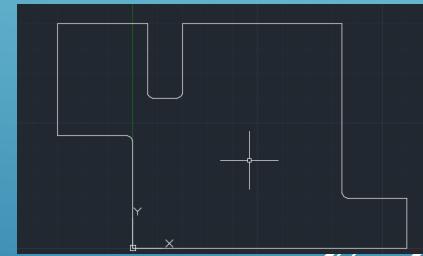
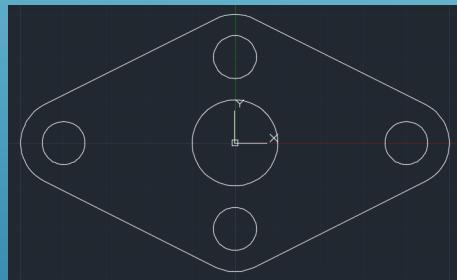
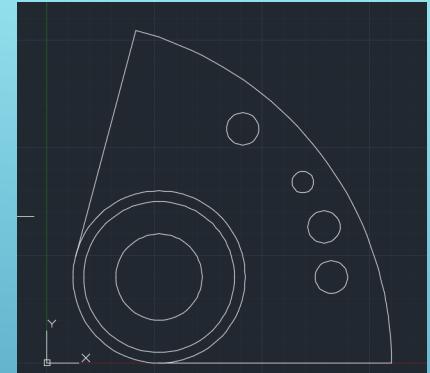
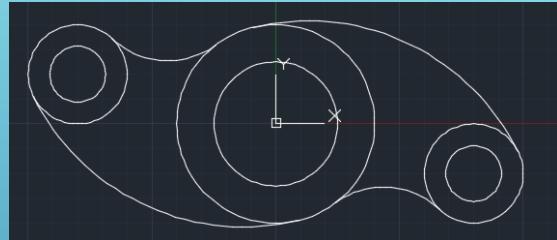
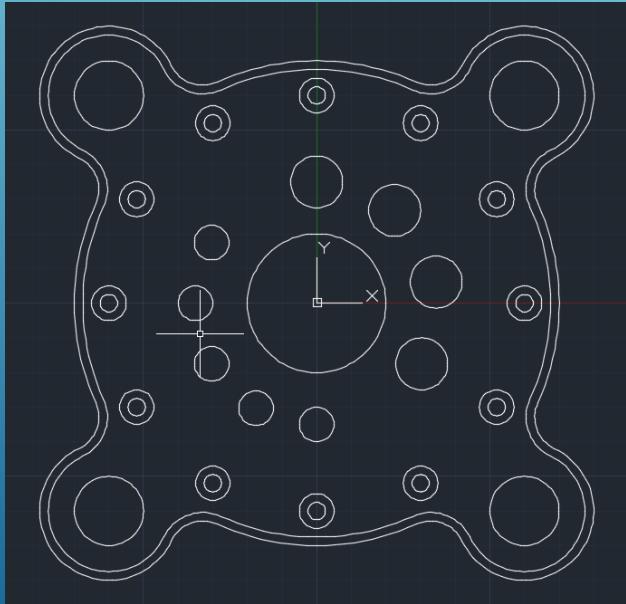
- AutoCad
- CNC
- Extreme Redesign
- Water Jet



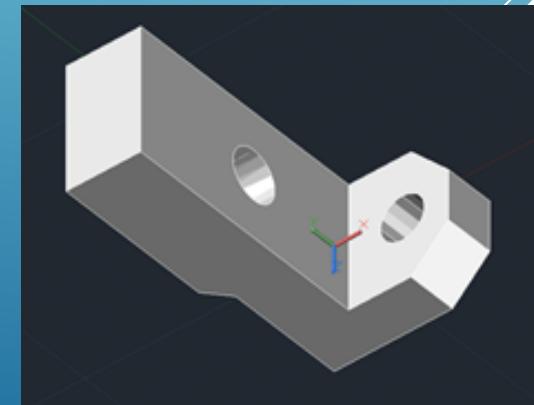
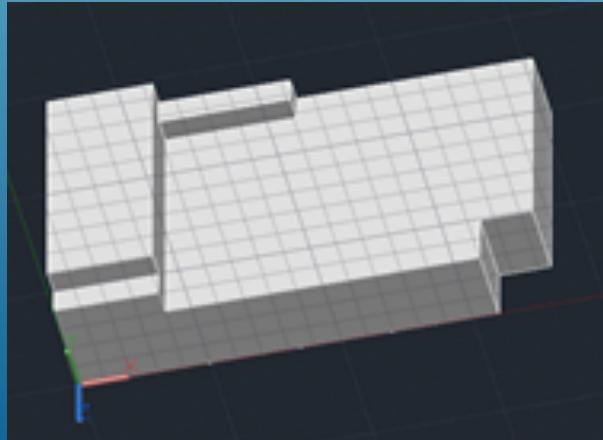
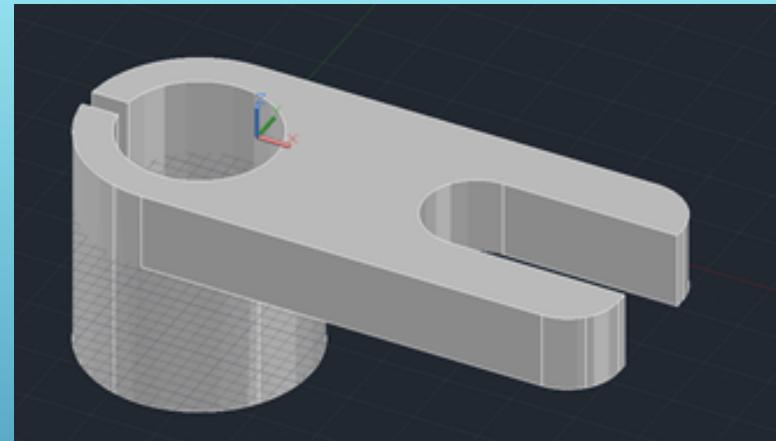
2D AutoCad



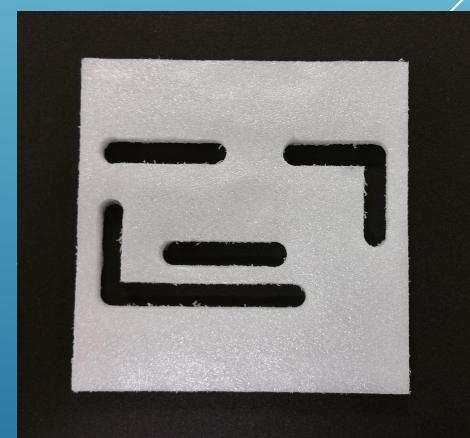
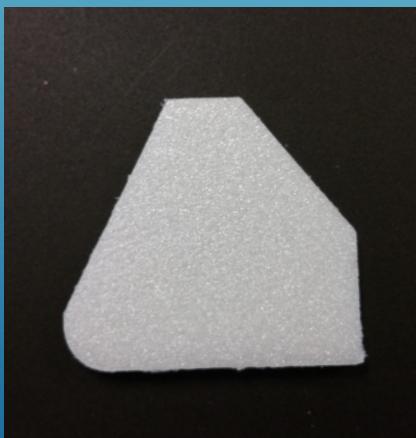
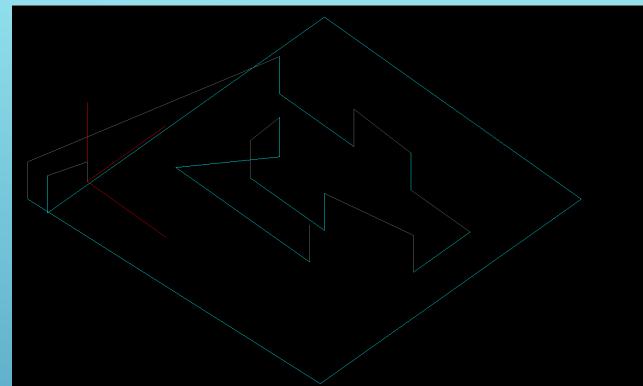
2D AutoCad



3D AutoCad



CNC Program

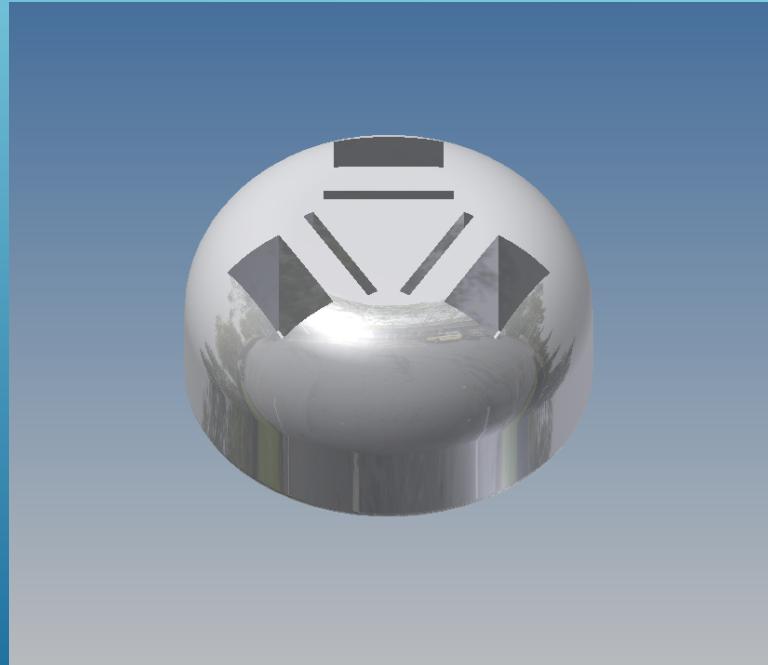


Extreme Redesign

- Designed a USB and SD card holder
- Holds up to 3 USB drives and 3 SD cards
- Keeps USB's and SD's in a safe location



USB and SD card holder

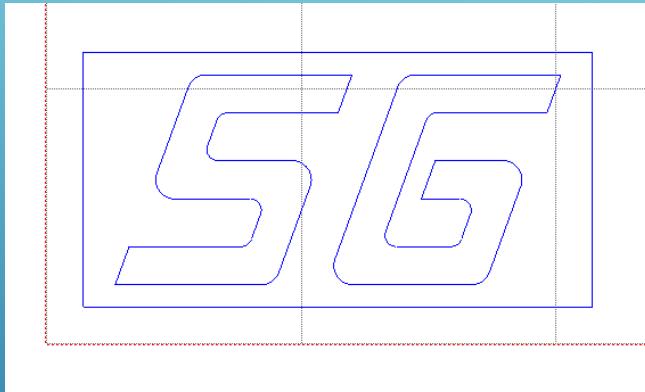


Water Jet Cutter

- Learned how to use FlowCut
- Learned how to use FlowPath
- Learned how to use the water jet
- Designed my initials in AutoDesk Inventor



Water Jet



Robotics Engineering

- Branch of Electrical Engineering
- Mechanical engineering, electrical engineering, and computer science
- Design and construction of robots
- Created automated machines that replace humans

High-density polyethylene (HDPE)

- Polyethylene thermoplastic made from petroleum
- Advantages
 - Lighter, cheaper, more corrosion proof, higher strength to weight, and easier to cut compared to metals
- Disadvantages
 - Soft, easily worn, bends and flex, cannot tap
- Made either by Ziegler-Natta or Phillips-type catalyst

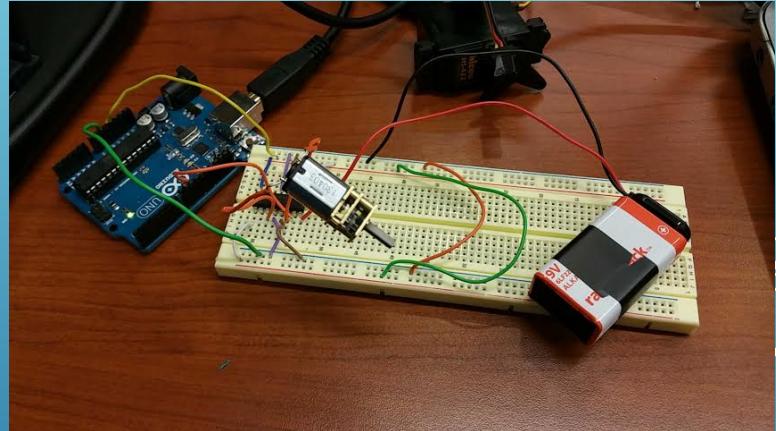
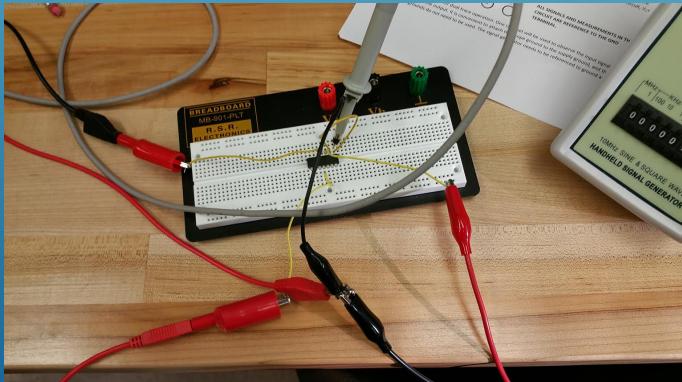
Electrical Engineering

- Designed and built a variety of circuits
- Passive and Active Circuits
- Arduino code



Electrical Engineering

- Servo Control by potentiometer
- Op Amp Temperature Sensor



Senior Capstone

- Combination of Electrical Engineering, Manufacturing Engineering, and Computer Science
- Robotics Engineering
- Arduino Controlled Stair Climber



Extracurricular Project - BarBot

- Hardware project at PennApps Winter 2015
- Design and laser cut box
- Servo motor to open lid
- Arduino and Android
- BarBot automatically lifts its cover using sonar data

