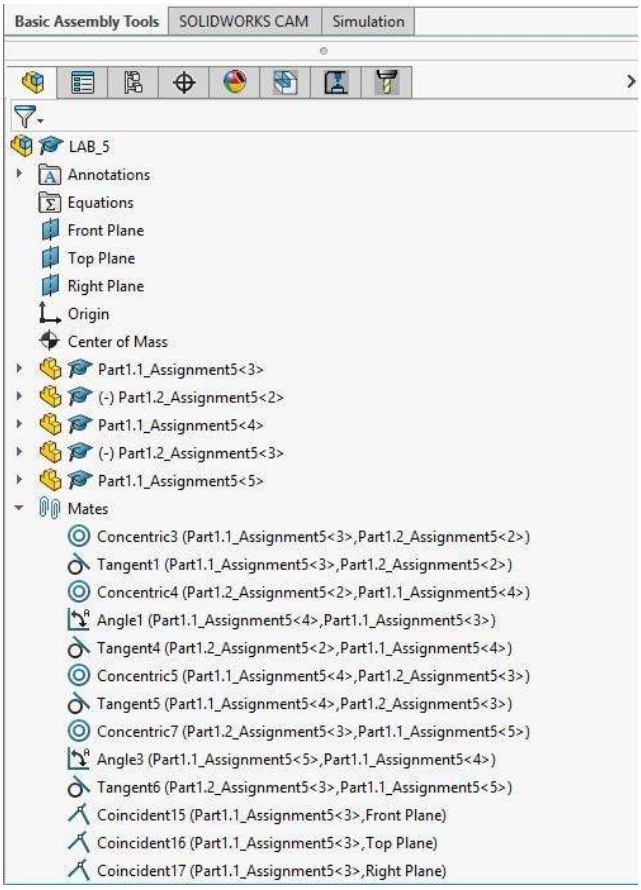
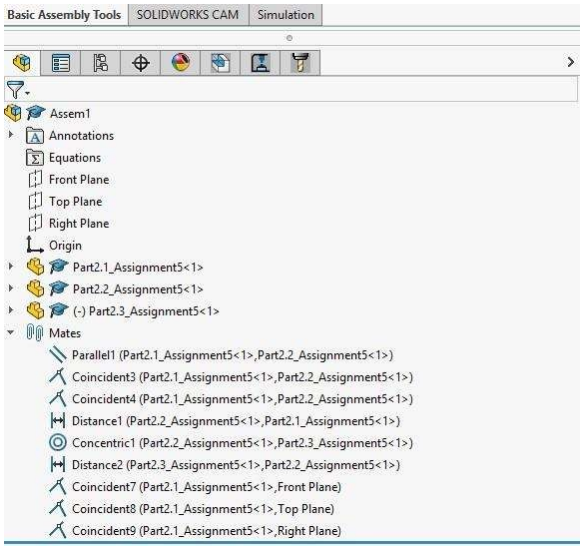
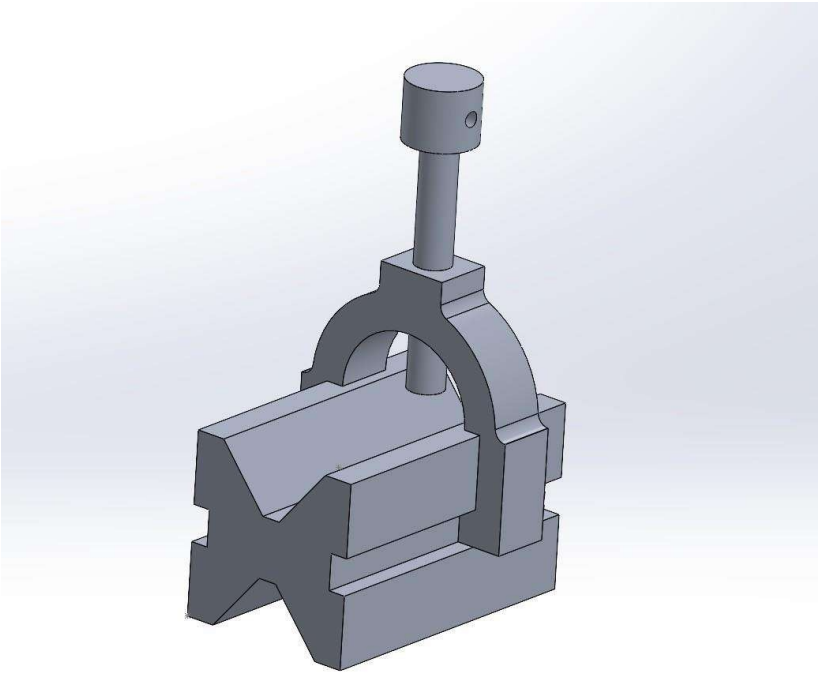
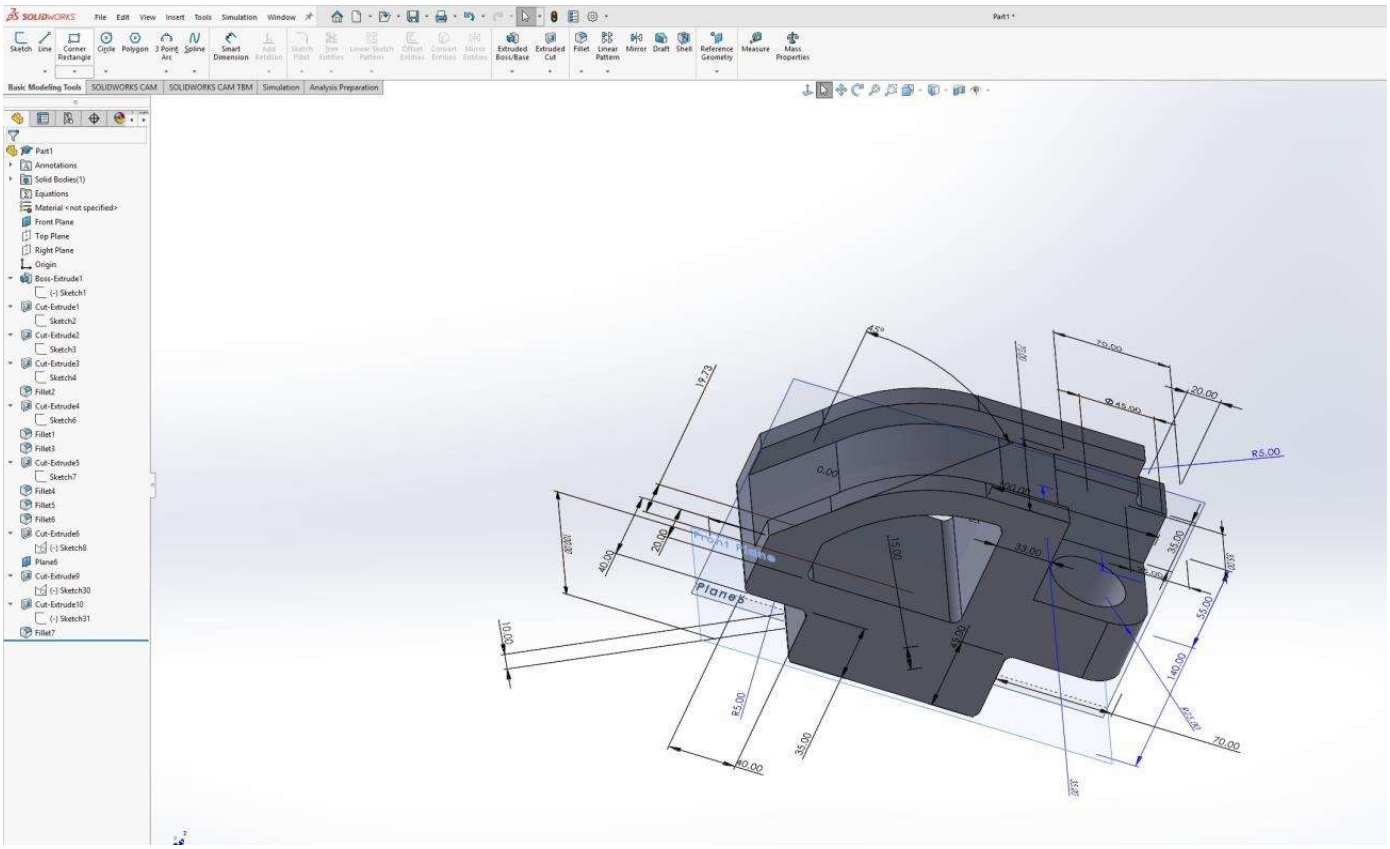
Keegan Usry Engineering Portfolio

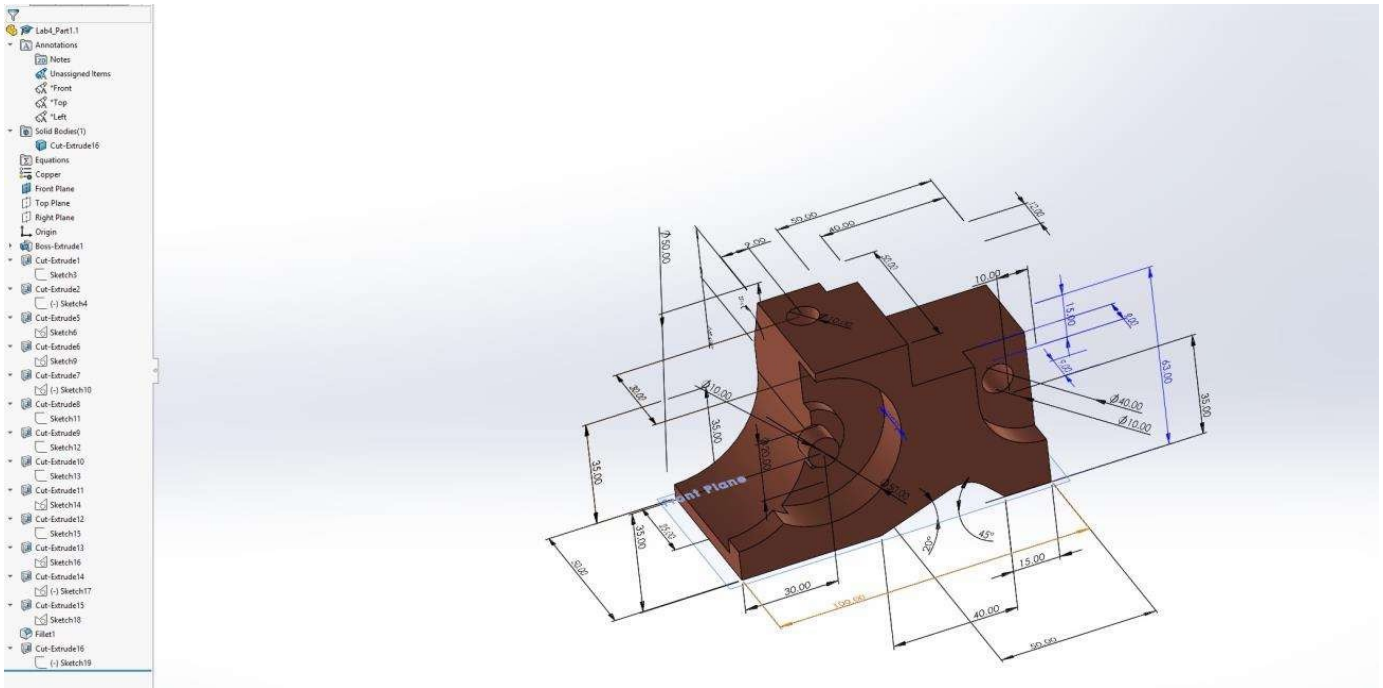


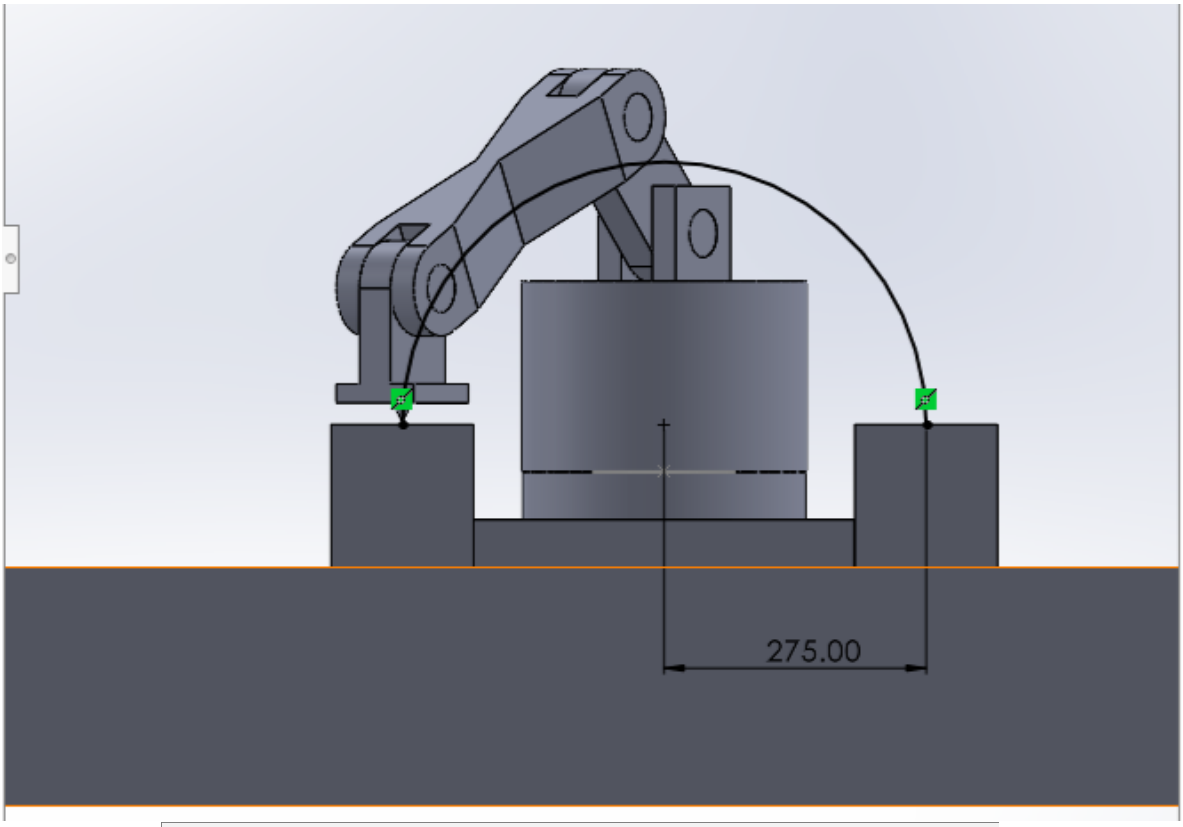


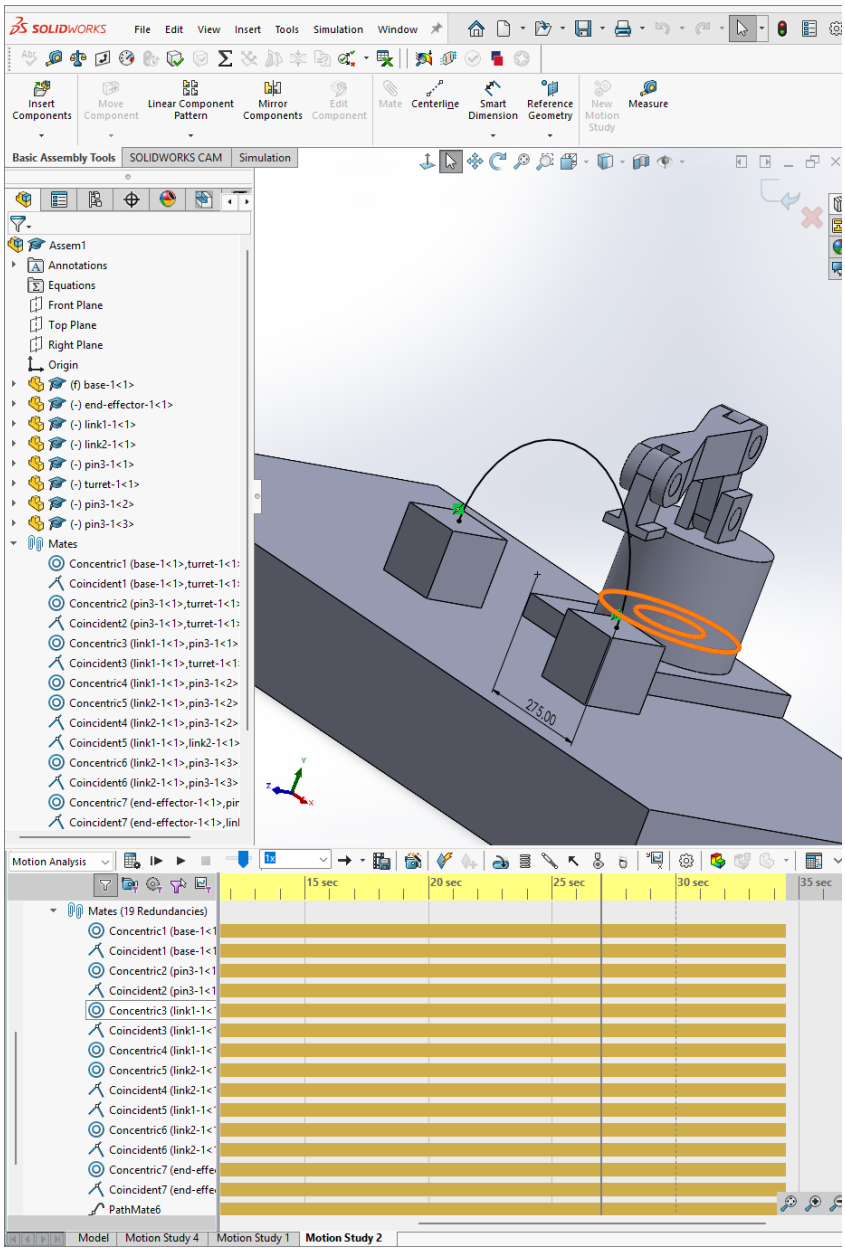


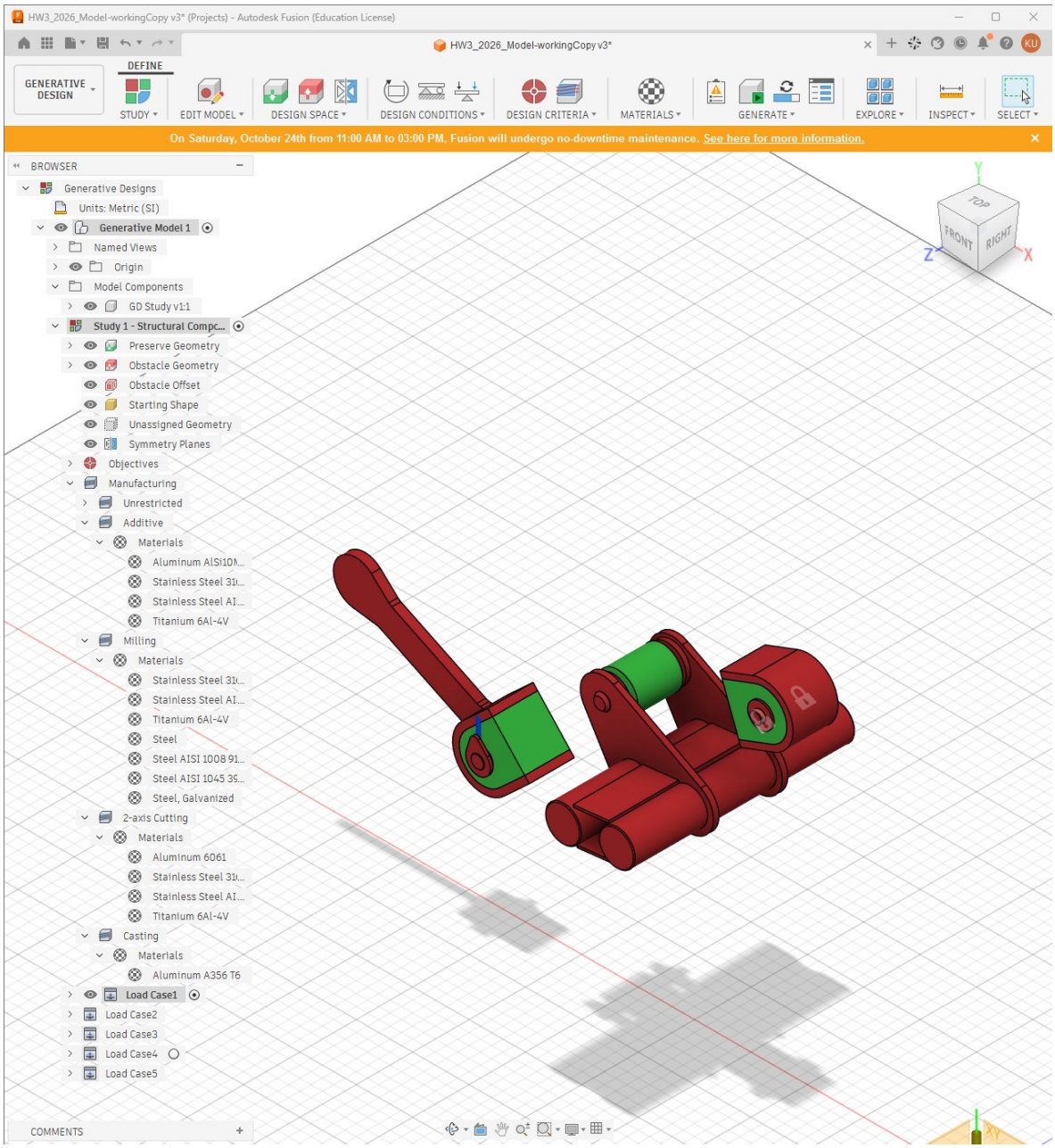


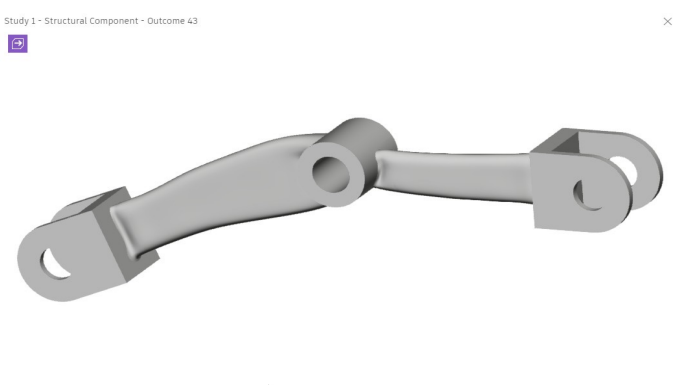

SOLIDWORKS
File Edit View Insert Tools Simulation Window
Part1
Sketch Line Corner Rectangle Circle Polygon 3 Point Arc Spline
Smart Dimension
Extruded Boss/Base Extruded Cut
Fillet Linear Pattern Mirror Draft Shell
Reference Geometry
Measure
Mass Properties
Basic Modeling Tools SOLIDWORKS CAM SOLIDWORKS CAM TBM Simulation Analysis Preparation
Part1
Annotations
Solid Bodies(1)
Equations
Material <not specified>
Front Plane
Top Plane
Right Plane
Origin
Boss-Extrude1
(-) Sketch1
Cut-Extrude1
Sketch2
Cut-Extrude2
Sketch3
Cut-Extrude3
Sketch4
Fillet2
Cut-Extrude4
Sketch6
Fillet1
Fillet3
Cut-Extrude5
Sketch7
Fillet4
Fillet5
Fillet6
Cut-Extrude6
(-) Sketch8
Plane6
Cut-Extrude9
(-) Sketch30
Cut-Extrude10
(-) Sketch31
Fillet7
Front Plane
Plane6
R5.00
20.00
45.00
15.00
33.00
55.00
140.00
70.00
85.00
40.00
35.00
10.00

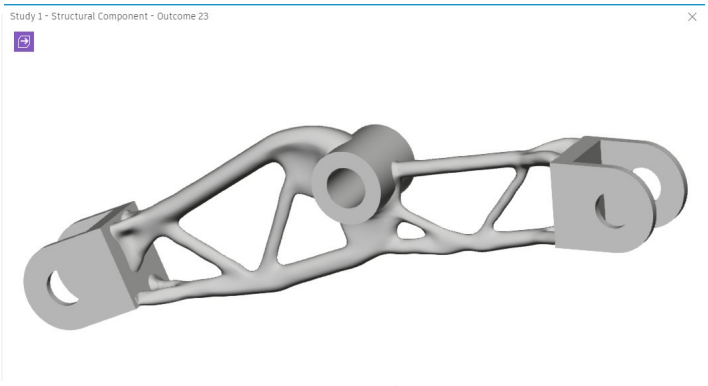

Lab4_Part1.1
Annotations
Notes
Unassigned Items
*Front
*Top
*Left
Solid Bodies(1)
Cut-Extrude16
Equations
Copper
Front Plane
Top Plane
Right Plane
Origin
Boss-Extrude1
Cut-Extrude1
Sketch3
Cut-Extrude2
(-) Sketch4
Cut-Extrude5
Sketch6
Cut-Extrude6
Sketch9
Cut-Extrude7
(-) Sketch10
Cut-Extrude8
Sketch11
Cut-Extrude9
Sketch12
Cut-Extrude10
Sketch13
Cut-Extrude11
Sketch14
Cut-Extrude12
Sketch15
Cut-Extrude13
Sketch16
Cut-Extrude14
(-) Sketch17
Cut-Extrude15
Sketch18
Fillet1
Cut-Extrude16
(-) Sketch19
Front Plane
50.00
40.00
2.00
10.00
15.00
43.00
35.00
Ø40.00
Ø10.00
30.00
45°
15.00
40.00

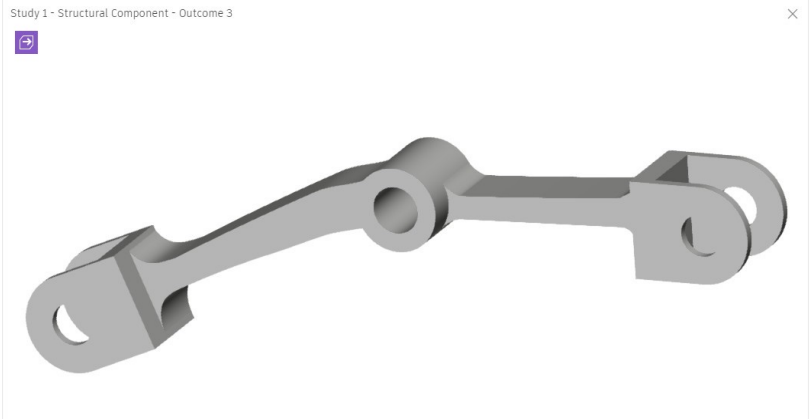

275.00

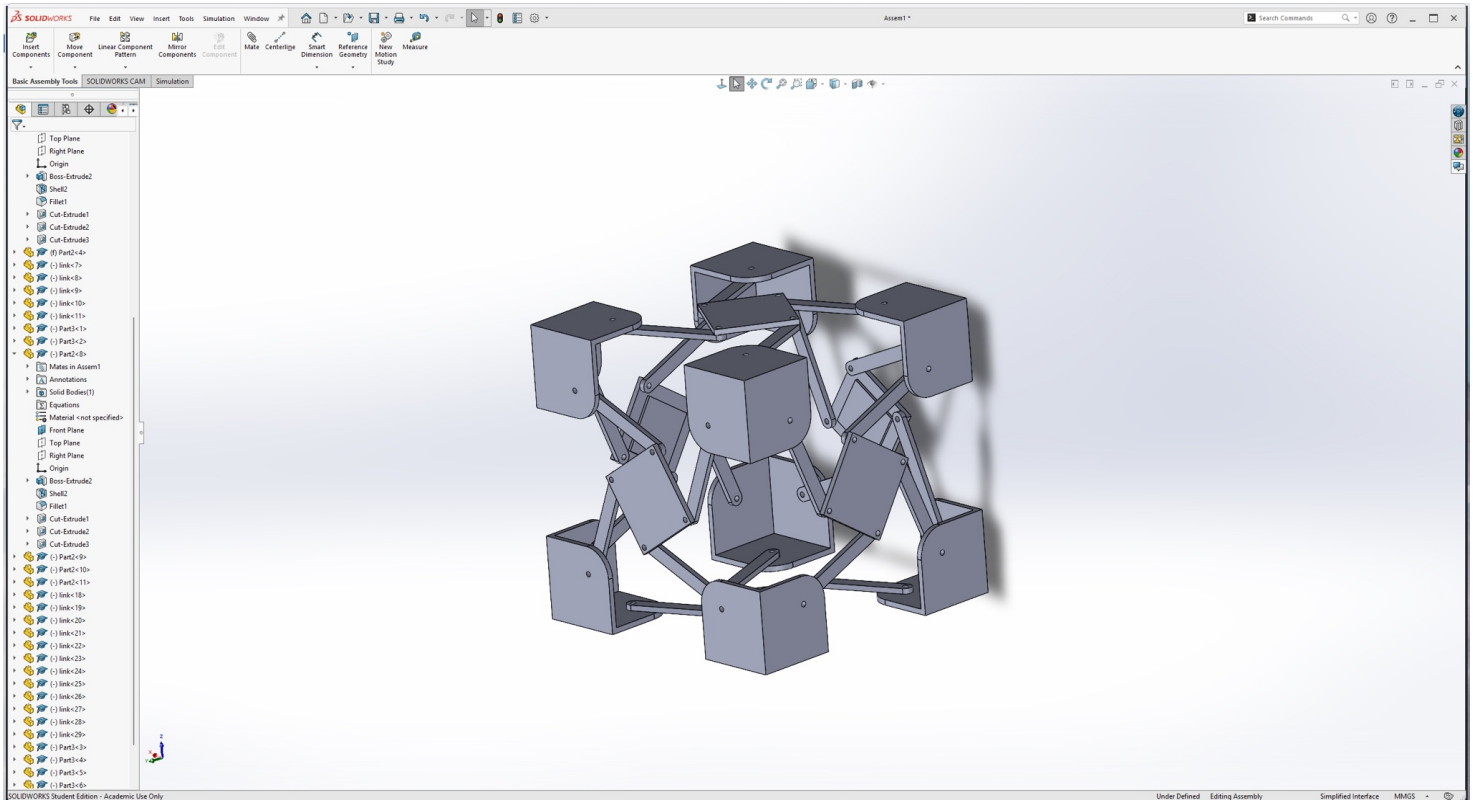

SOLIDWORKS
File Edit View Insert Tools Simulation Window
Insert Components
Move Component
Linear Component Pattern
Mirror Components
Edit Component
Mate
Centerline
Smart Dimension
Reference Geometry
New Motion Study
Measure
Basic Assembly Tools
SOLIDWORKS CAM
Simulation
Assem1
Annotations
Equations
Front Plane
Top Plane
Right Plane
Origin
(f) base-1<1>
(-) end-effector-1<1>
(-) link1-1<1>
(-) link2-1<1>
(-) pin3-1<1>
(-) turret-1<1>
(-) pin3-1<2>
(-) pin3-1<3>
Mates
Concentric1 (base-1<1>,turret-1<1:
Coincident1 (base-1<1>,turret-1<1:
Concentric2 (pin3-1<1>,turret-1<1:
Coincident2 (pin3-1<1>,turret-1<1:
Concentric3 (link1-1<1>,pin3-1<1>
Coincident3 (link1-1<1>,turret-1<1:
Concentric4 (link1-1<1>,pin3-1<2>
Concentric5 (link2-1<1>,pin3-1<2>
Coincident4 (link2-1<1>,pin3-1<2>
Coincident5 (link1-1<1>,link2-1<1>
Concentric6 (link2-1<1>,pin3-1<3>
Coincident6 (link2-1<1>,pin3-1<3>
Concentric7 (end-effector-1<1>,pir
Coincident7 (end-effector-1<1>,linl
275.00
Motion Analysis
15 sec
20 sec
25 sec
30 sec
35 sec
Mates (19 Redundancies)
Concentric1 (base-1<1
Coincident1 (base-1<1
Concentric2 (pin3-1<1
Coincident2 (pin3-1<1
Concentric3 (link1-1<
Coincident3 (link1-1<
Concentric4 (link1-1<
Concentric5 (link2-1<
Coincident4 (link2-1<
Coincident5 (link1-1<
Concentric6 (link2-1<
Coincident6 (link2-1<
Concentric7 (end-effe
Coincident7 (end-effe
PathMate6
Model
Motion Study 4
Motion Study 1
Motion Study 2

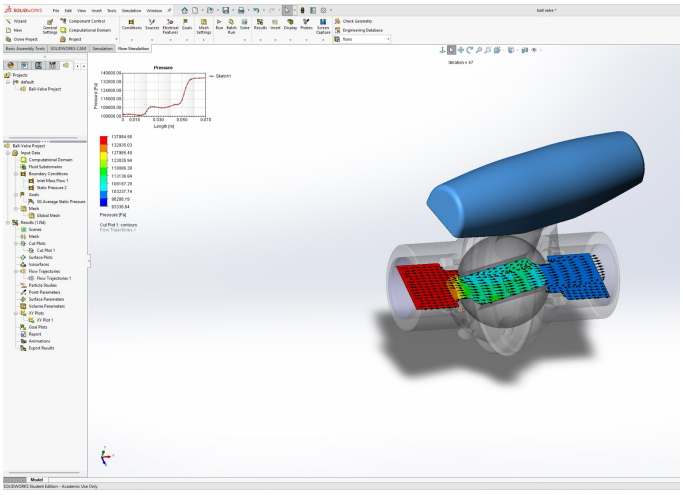

HW3_2026_Model-workingCopy v3* (Projects) - Autodesk Fusion (Education License)
HW3_2026_Model-workingCopy v3*
GENERATIVE DESIGN
DEFINE
STUDY
EDIT MODEL
DESIGN SPACE
DESIGN CONDITIONS
DESIGN CRITERIA
MATERIALS
GENERATE
EXPLORE
INSPECT
SELECT
On Saturday, October 24th from 11:00 AM to 03:00 PM, Fusion will undergo no-downtime maintenance. See here for more information.
BROWSER
Generative Designs
Units: Metric (SI)
Generative Model 1
Named Views
Origin
Model Components
GD Study v1:1
Study 1 - Structural Compc...
Preserve Geometry
Obstacle Geometry
Obstacle Offset
Starting Shape
Unassigned Geometry
Symmetry Planes
Objectives
Manufacturing
Unrestricted
Additive
Materials
Aluminum AlSi10M...
Stainless Steel 31...
Stainless Steel AI...
Titanium 6Al-4V
Milling
Materials
Stainless Steel 31...
Stainless Steel AI...
Titanium 6Al-4V
Steel
Steel AISI 1008 91...
Steel AISI 1045 36...
Steel, Galvanized
2-axis Cutting
Materials
Aluminum 6061
Stainless Steel 31...
Stainless Steel AI...
Titanium 6Al-4V
Casting
Materials
Aluminum A356 T6
Load Case1
Load Case2
Load Case3
Load Case4
Load Case5
COMMENTS
TOP
FRONT
RIGHT
Y
Z
X

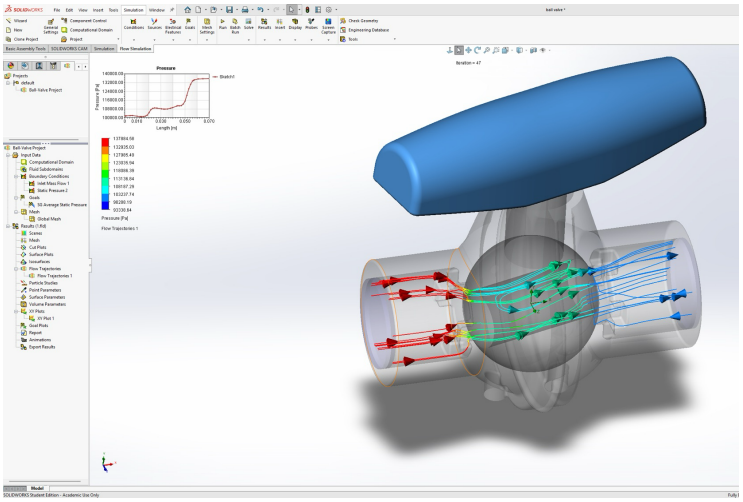

Study 1 - Structural Component - Outcome 43

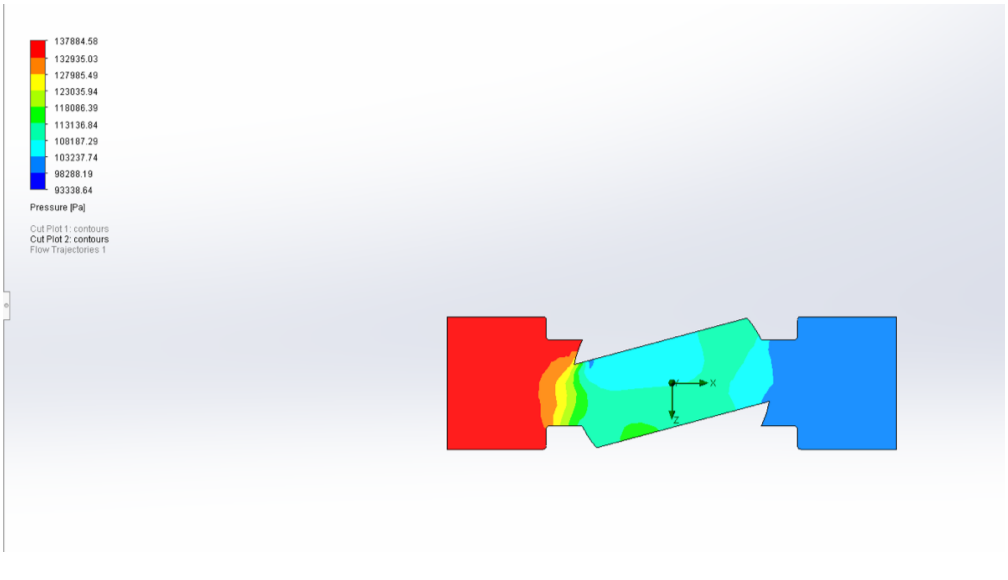

Study 1 - Structural Component - Outcome 23

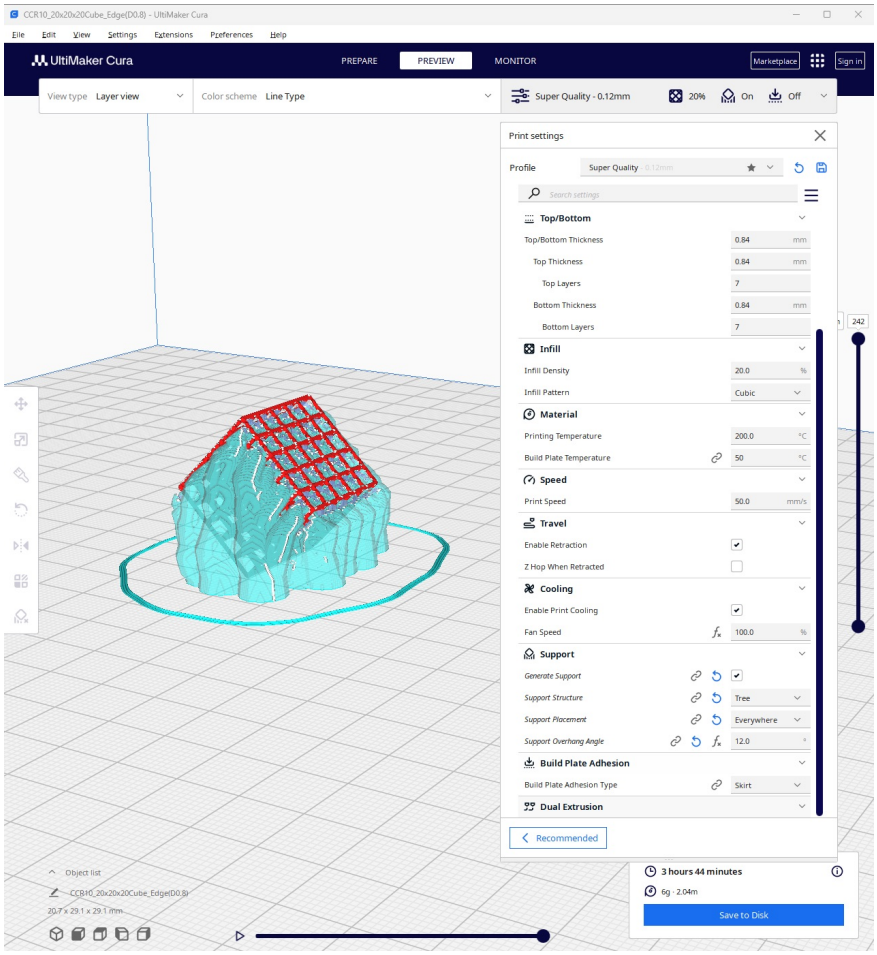

Study 1 - Structural Component - Outcome 3

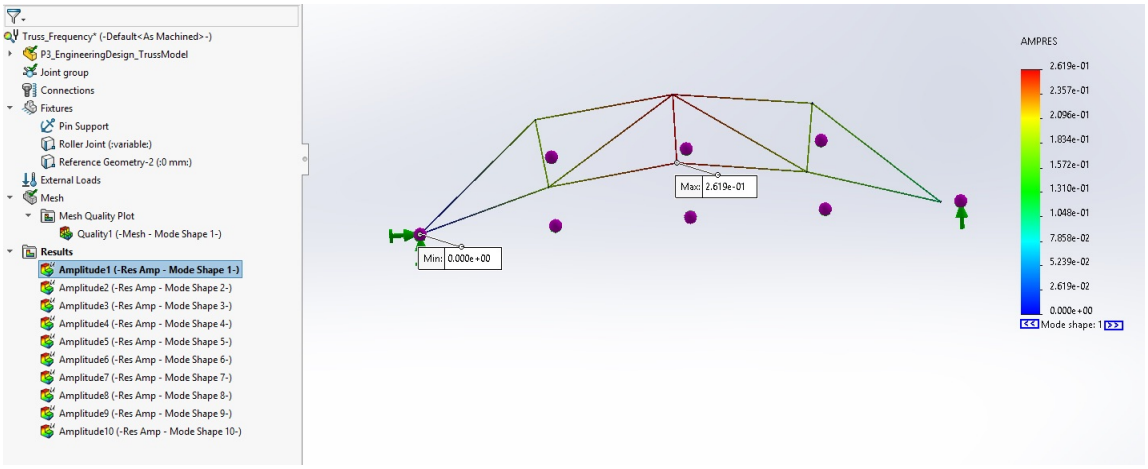

SOLIDWORKS
Assem1 *
Top Plane
Right Plane
Origin
Boss-Extrude2
Shell2
Fillet1
Cut-Extrude1
Cut-Extrude2
Cut-Extrude3
SOLIDWORKS Student Edition - Academic Use Only

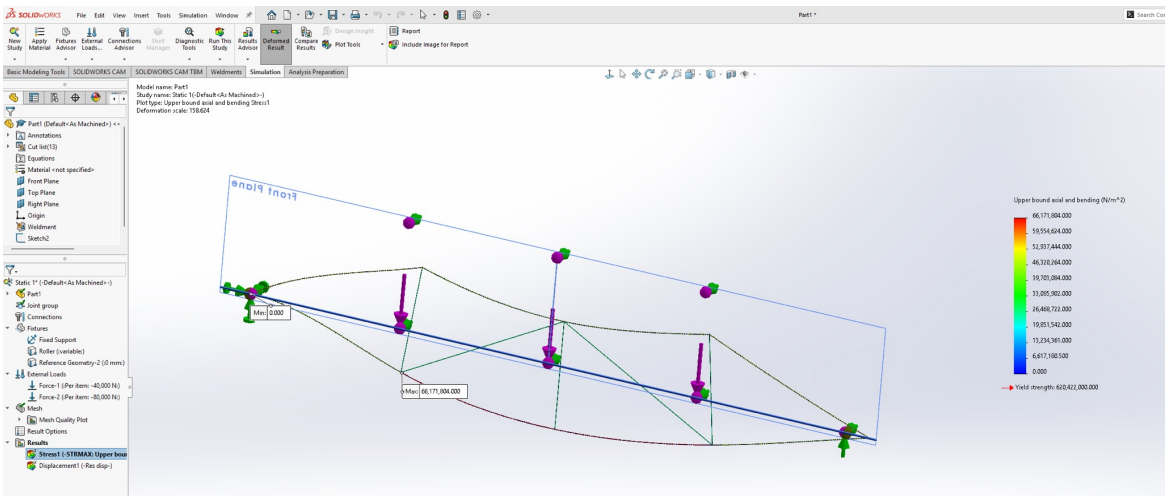


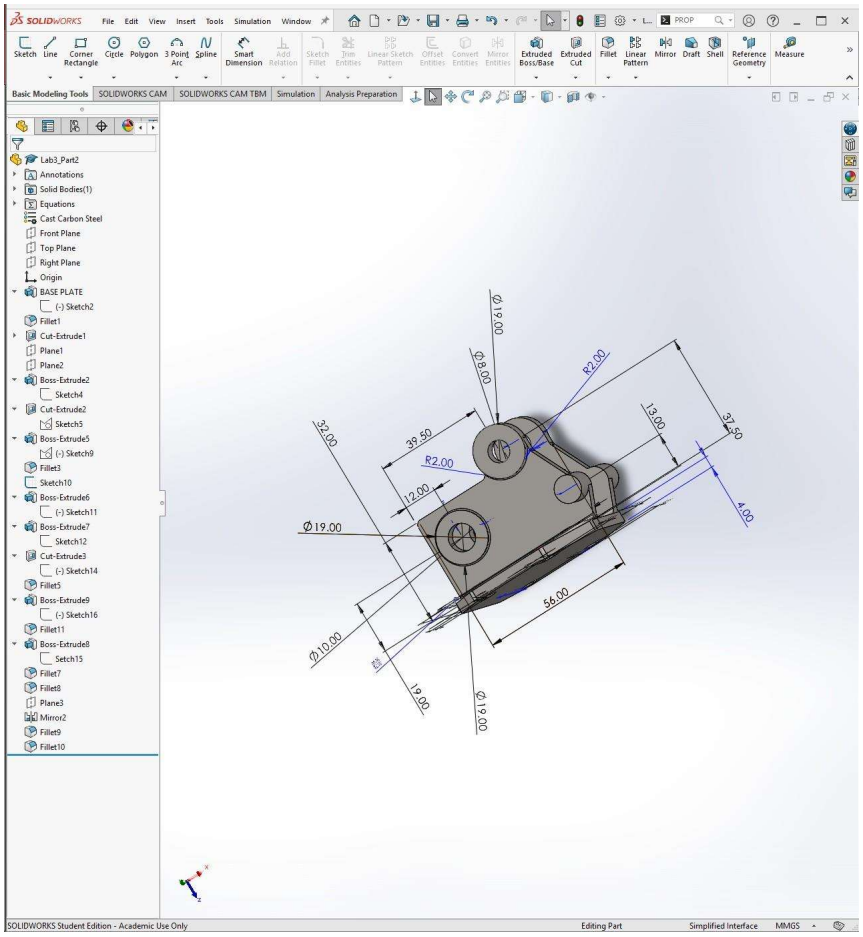


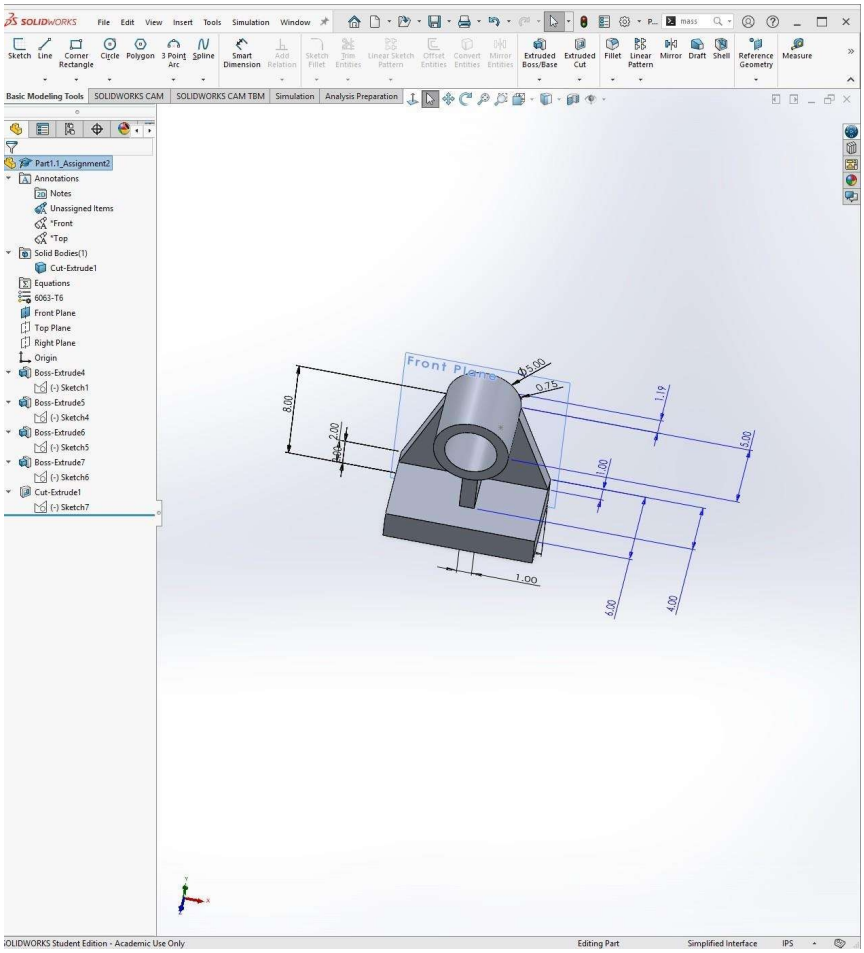

137884.58
132935.03
127985.49
123035.94
118086.39
113136.84
108187.29
103237.74
98288.19
93338.64
Pressure [Pa]
Cut Plot 1: contours
Cut Plot 2: contours
Flow Trajectories 1

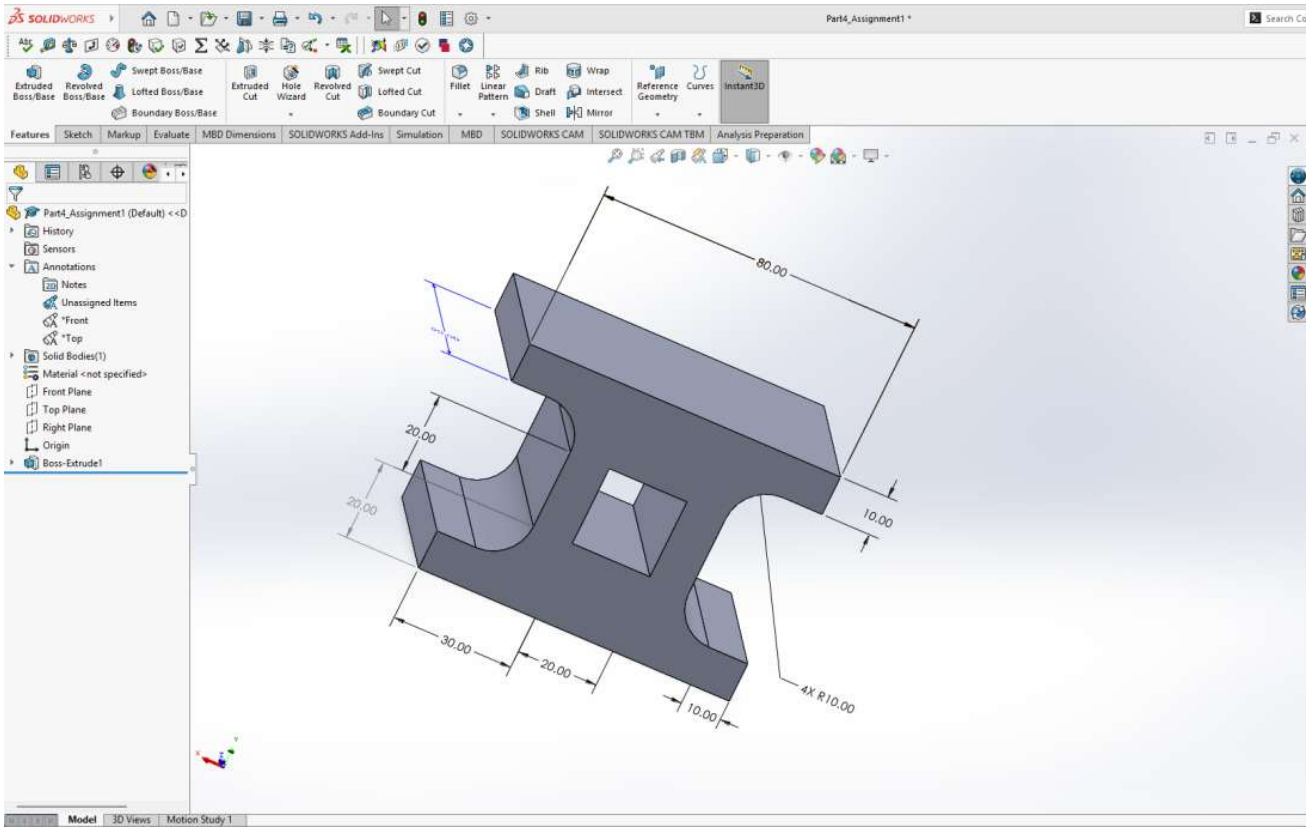

CCR10_20x20x20Cube_Edge(D0.8) - UltiMaker Cura
File Edit View Settings Extensions Preferences Help
UltiMaker Cura
PREPARE
PREVIEW
MONITOR
Marketplace
Sign in
View type Layer view
Color scheme Line Type
Super Quality - 0.12mm
20%
On
Off
Print settings
Profile
Super Quality - 0.12mm
Search settings
Top/Bottom
Top/Bottom Thickness 0.84 mm
Top Thickness 0.84 mm
Top Layers 7
Bottom Thickness 0.84 mm
Bottom Layers 7
Infill
Infill Density 20.0 %
Infill Pattern Cubic
Material
Printing Temperature 200.0 °C
Build Plate Temperature 50 °C
Speed
Print Speed 50.0 mm/s
Travel
Enable Retraction
Z Hop When Retracted
Cooling
Enable Print Cooling
Fan Speed 100.0 %
Support
Generate Support
Support Structure Tree
Support Placement Everywhere
Support Overhang Angle 12.0 °
Build Plate Adhesion
Build Plate Adhesion Type Skirt
Dual Extrusion
Recommended
242
Object list
CCR10_20x20x20Cube_Edge(D0.8)
20.7 x 29.1 x 29.1 mm
3 hours 44 minutes
6g · 2.04m
Save to Disk

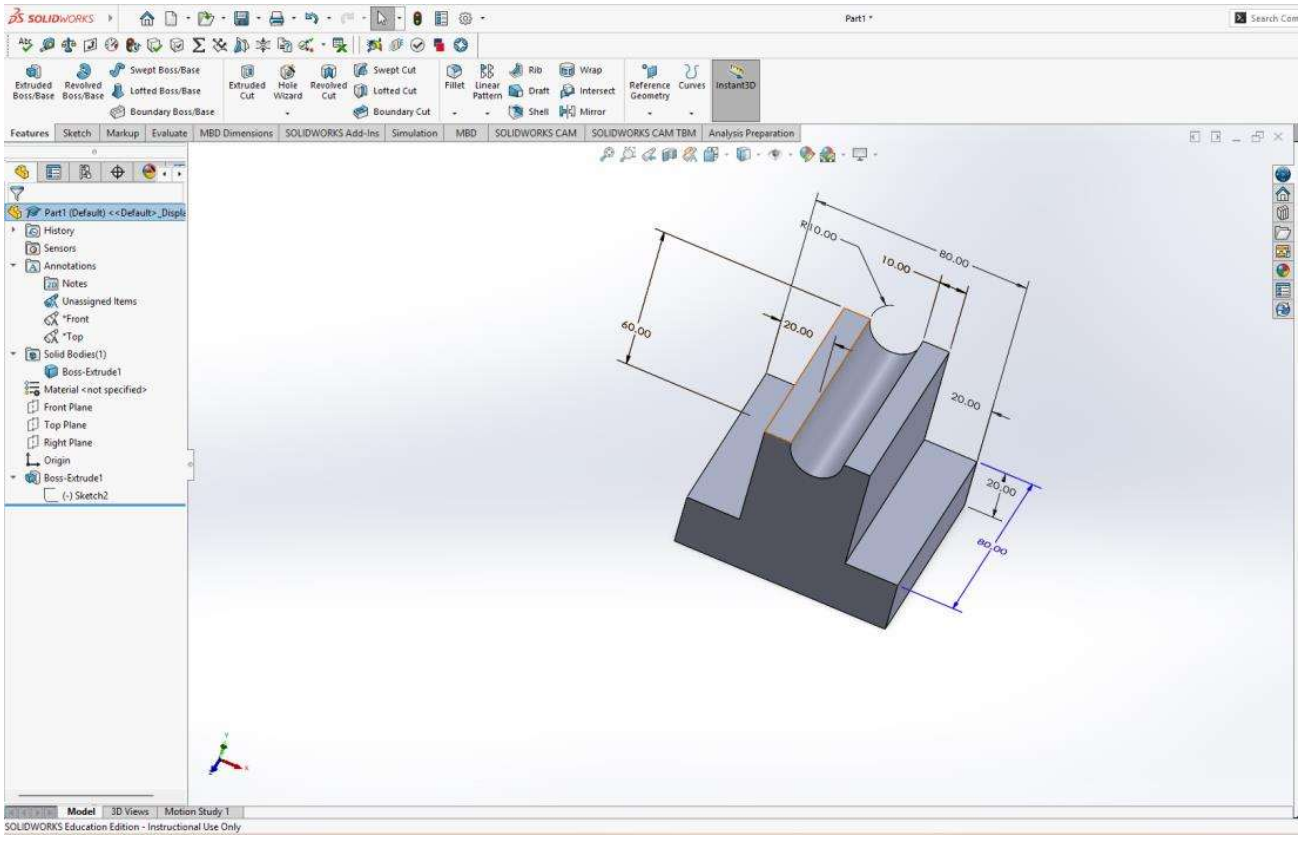

Truss_Frequency* (-Default<As Machined>-)
P3_EngineeringDesign_TrussModel
Joint group
Connections
Fixtures
Pin Support
Roller Joint (:variable:)
Reference Geometry-2 (:0 mm:)
External Loads
Mesh
Mesh Quality Plot
Quality1 (-Mesh - Mode Shape 1-)
Results
Amplitude1 (-Res Amp - Mode Shape 1-)
Amplitude2 (-Res Amp - Mode Shape 2-)
Amplitude3 (-Res Amp - Mode Shape 3-)
Amplitude4 (-Res Amp - Mode Shape 4-)
Amplitude5 (-Res Amp - Mode Shape 5-)
Amplitude6 (-Res Amp - Mode Shape 6-)
Amplitude7 (-Res Amp - Mode Shape 7-)
Amplitude8 (-Res Amp - Mode Shape 8-)
Amplitude9 (-Res Amp - Mode Shape 9-)
Amplitude10 (-Res Amp - Mode Shape 10-)
Max: 2.619e-01
Min: 0.000e+00
AMPRES
2.619e-01
2.357e-01
2.096e-01
1.834e-01
1.572e-01
1.310e-01
1.048e-01
7.858e-02
5.239e-02
2.619e-02
0.000e+00
Mode shape: 1

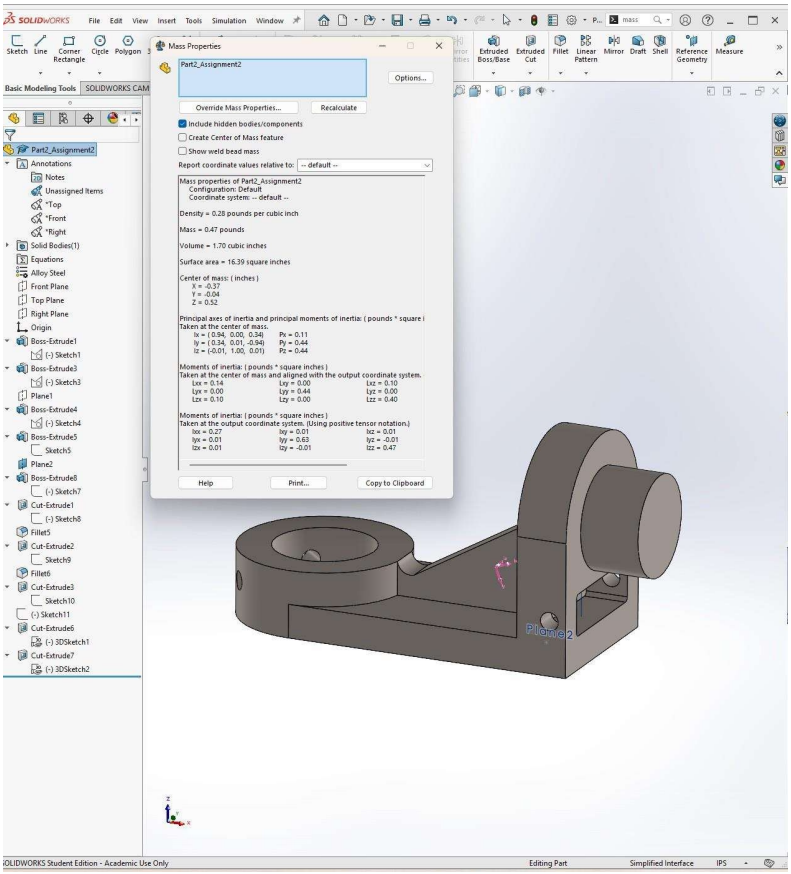

SOLIDWORKS
Front Plane
Min: 0.000
Max: 66,171,804.000
Upper bound axial and bending (N/m^2)
66,171,804.000
59,554,624.000
52,937,444.000
46,320,264.000
39,703,084.000
33,085,902.000
26,468,722.000
19,851,542.000
13,234,361.000
6,617,180.500
0.000
Yield strength: 620,422,000.000

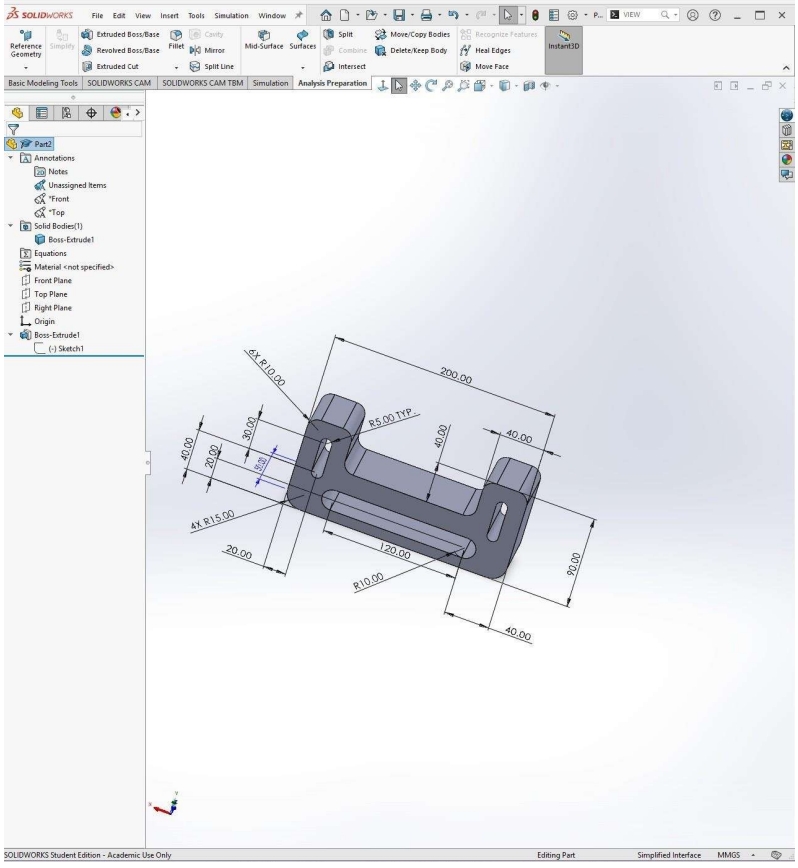

SOLIDWORKS
File Edit View Insert Tools Simulation Window
Basic Modeling Tools SOLIDWORKS CAM SOLIDWORKS CAM TBM Simulation Analysis Preparation
Lab3_Part2
Annotations
Solid Bodies(1)
Equations
Cast Carbon Steel
Front Plane
Top Plane
Right Plane
Origin
BASE PLATE
(-) Sketch2
Fillet1
Cut-Extrude1
Plane1
Plane2
Boss-Extrude2
Sketch4
Cut-Extrude2
Sketch5
Boss-Extrude5
(-) Sketch9
Fillet3
Sketch10
Boss-Extrude6
(-) Sketch11
Boss-Extrude7
Sketch12
Cut-Extrude3
(-) Sketch14
Fillet5
Boss-Extrude9
(-) Sketch16
Fillet11
Boss-Extrude8
Setch15
Fillet7
Fillet8
Plane3
Mirror2
Fillet9
Fillet10
Ø19.00
Ø8.00
R2.00
13.00
37.50
32.00
39.50
R2.00
12.00
Ø19.00
4.00
56.00
Ø10.00
19.00
Ø19.00
SOLIDWORKS Student Edition - Academic Use Only
Editing Part
Simplified Interface
MMGS


SOLIDWORKS
File Edit View Insert Tools Simulation Window
Basic Modeling Tools SOLIDWORKS CAM SOLIDWORKS CAM TBM Simulation Analysis Preparation
Part1.1_Assignment2
Annotations
Notes
Unassigned Items
*Front
*Top
Solid Bodies(1)
Cut-Extrude1
Equations
6063-T6
Front Plane
Top Plane
Right Plane
Origin
Boss-Extrude4
(-) Sketch1
Boss-Extrude5
(-) Sketch4
Boss-Extrude6
(-) Sketch5
Boss-Extrude7
(-) Sketch6
Cut-Extrude1
(-) Sketch7
Front Plane
Ø3.00
0.75
1.19
8.00
2.00
5.00
1.00
1.00
4.00
4.00
SOLIDWORKS Student Edition - Academic Use Only
Editing Part
Simplified Interface
IPS


SOLIDWORKS
Part4_Assignment1 *
Extruded Boss/Base
Revolved Boss/Base
Swept Boss/Base
Lofted Boss/Base
Boundary Boss/Base
Extruded Cut
Hole Wizard
Revolved Cut
Swept Cut
Lofted Cut
Boundary Cut
Fillet
Linear Pattern
Rib
Draft
Shell
Wrap
Intersect
Mirror
Reference Geometry
Curves
Instant3D
Features
Sketch
Markup
Evaluate
MBD Dimensions
SOLIDWORKS Add-Ins
Simulation
MBD
SOLIDWORKS CAM
SOLIDWORKS CAM TBM
Analysis Preparation
Part4_Assignment1 (Default) <<D
History
Sensors
Annotations
Notes
Unassigned Items
*Front
*Top
Solid Bodies(1)
Material <not specified>
Front Plane
Top Plane
Right Plane
Origin
Boss-Extrude1
80.00
20.00
20.00
10.00
30.00
20.00
10.00
4X R10.00
Model
3D Views
Motion Study 1


SOLIDWORKS
Part1 *
Extruded Boss/Base
Revolved Boss/Base
Swept Boss/Base
Lofted Boss/Base
Boundary Boss/Base
Extruded Cut
Hole Wizard
Revolved Cut
Swept Cut
Lofted Cut
Boundary Cut
Fillet
Linear Pattern
Rib
Draft
Shell
Wrap
Intersect
Mirror
Reference Geometry
Curves
Instant3D
Features
Sketch
Markup
Evaluate
MBD Dimensions
SOLIDWORKS Add-Ins
Simulation
MBD
SOLIDWORKS CAM
SOLIDWORKS CAM TBM
Analysis Preparation
Part1 (Default) <<Default>_Displ
History
Sensors
Annotations
Notes
Unassigned Items
*Front
*Top
Solid Bodies(1)
Boss-Extrude1
Material <not specified>
Front Plane
Top Plane
Right Plane
Origin
Boss-Extrude1
(-) Sketch2
R10.00
10.00
80.00
60.00
20.00
20.00
20.00
80.00
Model
3D Views
Motion Study 1
SOLIDWORKS Education Edition - Instructional Use Only


Mass Properties
Part2_Assignment2
Options...
Override Mass Properties...
Recalculate
Include hidden bodies/components
Create Center of Mass feature
Show weld bead mass
Report coordinate values relative to: -- default --
Mass properties of Part2_Assignment2
Configuration: Default
Coordinate system: -- default --
Density = 0.28 pounds per cubic inch
Mass = 0.47 pounds
Volume = 1.70 cubic inches
Surface area = 16.39 square inches
Center of mass: (inches)
X = -0.37
Y = -0.04
Z = 0.52
Help
Print...
Copy to Clipboard
Plane2
Editing Part
Simplified Interface
IPS


4X R10.00
200.00
R5.00 TYP
40.00
40.00
30.00
40.00
20.00
4X R15.00
20.00
120.00
R10.00
90.00
40.00
Editing Part
Simplified Interface
MMGS