ITP 308: Homework 4

Due: February 17, 2021 11:59pm

Setup

In this assignment, you will create four parts to create a full piston/connecting rod assembly. As we have already seen, the connecting rod connects the piston to the crankshaft. The connecting rod and the piston are joined by a pin, about which the piston is free to rotate.

You will be required to create the piston, connecting rod, connecting rod coupler, and the pin as dimensioned in the drawings.

You will need to use the Hole Wizard to create the holes in the connecting rod and the connecting rod coupler where a fastener will go. Create a dowel hole with a 6mm diameter. This becomes important in the assembly.

Once all the parts are created, combine them in to one assembly with the connecting rod as the base part (the first part you put in the assembly). The connecting rod's origin should be coincident with the origin of the assembly (axes aligned). When adding the piston, make the top face of the piston parallel to the top plane of the assembly.

From there, add the other components, (piston, coupler, pin) and make sure that everything is mated to ensure that everything is fully defined. You should not fix any part at all.

Note: You do not need to add the fasteners (the bolts and nuts you see in the assembly) since it may not be loaded up in the VDI.

Materials

All user-created parts are Plain Carbon Steel.

Mass Properties

Here are the Mass Properties for each Part

	Conrod	Piston	Coupler	Pin	Assembly
Mass (grams)	427.30	1273.93	123.93	273.26	2098.43
COM X (mm)	0	0	0	0	0
COM Y (mm)	-8.32	12.70	-13.18	0	56.83
COM Z (mm)	0	0	0	0	0

A deviation of ± 1% of the mass or COM values is deemed acceptable standard unless the deviation is due to improper dimensioning or form.

Grading

Description	Points

Conrod	7 points
Coupler	7 points
Pin	4 points
Piston	18 points
Assembly	14 points
Total	50 points

Deliverables

Name your files:

CarbonSteelConrod.sldprt

CarbonSteelCoupler.sldprt

CarbonSteelPiston.sldprt

CarbonSteelPin.sldprt

PistonAssembly.sldasm

Compress them into a single zip file and name it:

***username*_HW4.zip**

Where *username* is your USC username.