Lab – Advanced Modeling – Gear Assembly

Instructions:

1. The units for this assignment are ANSI.
2. Use In Class parts, Bracket, Shaft, and Key.
3. Create a 16 tooth gear with a Pitch Diameter of 2" using numbers below and the Gear references in the Reference section of *Course Content*.
4. Create another gear with a Pitch Diameter of 4" and the same Diametral Pitch as the 16 tooth gear.
5. Create a shaft and key sub-assembly.
6. Create a gear assembly using these parts.
7. Create a Gear Mate that keeps the gears from intersecting.
8. Use the Toolbox to add fasteners to the brackets.
9. Create a Thread Mate between the fasteners and the brackets.
10. Add material – Stainless Steel.
11. Create and assembly drawing with a BOM that shows the parts of the sub-assembly.
12. When complete, submit to Gear Assembly Dropbox in eLearn.

Numbers for 16 Tooth Gear:

Term	Variable	Formula	16 Tooth Value
Pitch Diameter	D	D = N/P	D = 2
Number of Teeth	N	N = D*P	N = 16
Diametral Pitch	P	P = N/D	P = 16/2 = 8
Circular Pitch	p	p = π/P	p = π/8 = .3927
Circular Thickness	t	t = p/2	t = .3927/2 = .1963
Addendum	a	a = 1/P	a = 1/8 = .125
Dedendum	b	b = 1.157/P	b = 1.157/8 = .1446
Root Diameter	D_R	D_R = D – 2b	D_R = 2 – 2(.1446) = 1.711
Fillet	o		o = .025R

Use 14.5˚ Involute Tooth:

r (from Chart) = 1.16 r (per tooth) = 1.16/8 = .145

R (from Chart) = 3.46 R (per tooth) = 3.46/8 = .4325