# EXPERIMENT-6

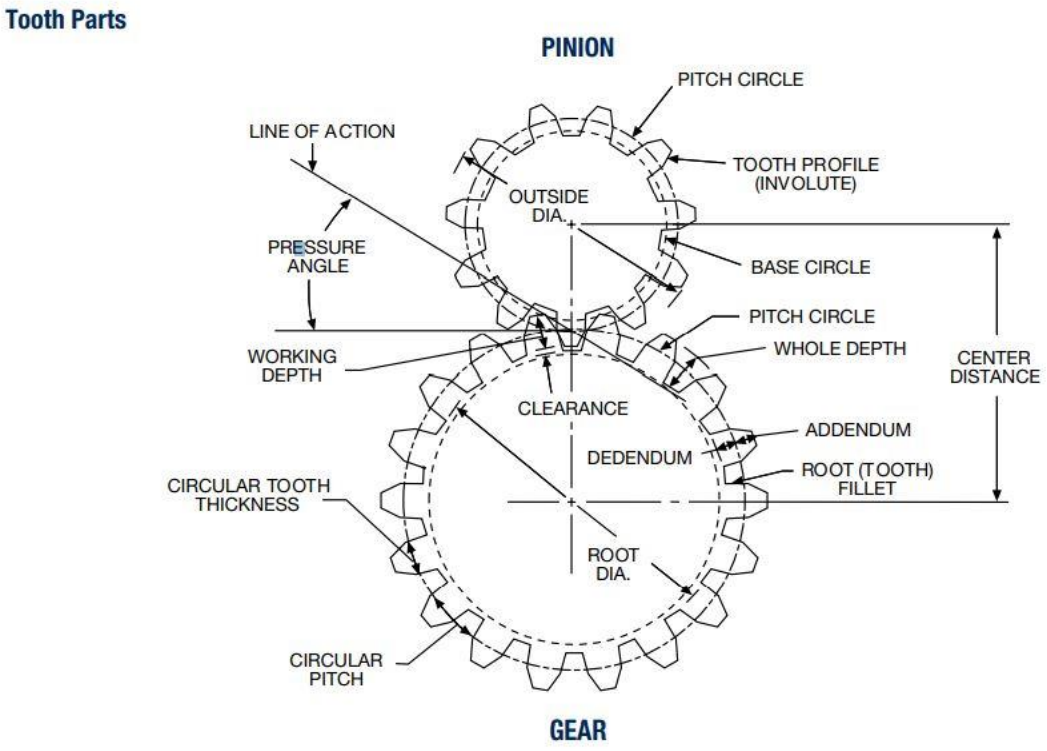
**AIM:** To create Spur Gears.

**SOFTWARE USED:** Solidworks 2020

**THEORY:**

The spur gear is the least expensive of all gears to manufacture and is the most commonly used. It can be manufactured to close tolerances and is used to connect parallel shafts that rotate in opposite directions. It gives excellent results at moderate peripheral speeds and the tooth load produces no axial thrust. Because contact is simultaneous across the entire width of the meshing teeth, it tends to be noisy at high speeds.

The spur gear is cylindrical and has straight teeth cut parallel to its rotational axis. The tooth size of spur gears is established by the diametrical pitch. Spur-gear design accommodates mostly rolling, rather than sliding, contact of the tooth surfaces and tooth contact occurs along a line parallel to the axis. Such rolling contact produces less heat and yields high mechanical efficiency, often up to 99 per cent.



**Spur Gears Nomenclature:**

Where:
$\varphi$ = Pressure Angle
a = Addendum
$a_G$ = Addendum of Gear
$a_P$ = Addendum of Pinion
b = Dedendum
c = Clearance
C = Center Distance
D = Pitch Diameter
$D_G$ = Pitch Diameter of Gear
$D_P$ = Pitch Diameter of Pinion
$D_B$ = Base Circle Diameter
$D_O$ = Outside Diameter
DR = Root Diameter
F = Face Width
$h_k$ = Working Depth of Tooth
$h_t$ = Whole Depth of Tooth
$m_G$ = Gear Ratio
N = Number of Teeth
$N_G$ = Number of Teeth in Gear
$N_P$ = Number of Teeth in Pinion
p = Circular Pitch
P=Diametral Pitch

**COMMANDS USED:**

1. Sketch
2. Mirror
3. Boss extrude
4. Extrude cut
5. Mate
6. Pattern
7. Fillet
8. Copy

**PROCEDURE:**

1. First draw a circle of 92.5 mm and teeth on it according to given dimensions.

2. Now use the circular pattern to make all teeth of the gear.

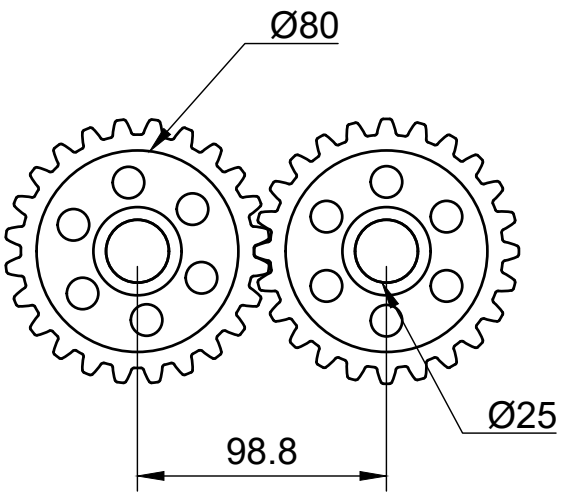
3. To make the gear use boss extrude to 16 mm.

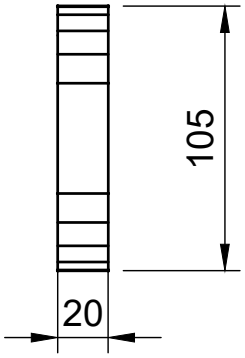
4. Now take a circle of 80 mm and boss cut exrude to 2 mm on both sides.

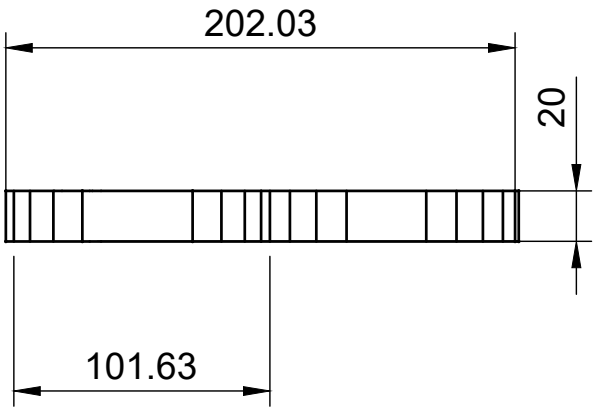
5. Make 6 circles of 12 mm with circular pattern and then boss extrude cut through all.

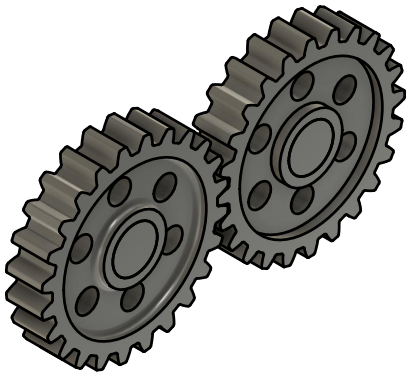
6. Finally draw fillet on all teeth of 1 mm and fillet on faces inside edge of 3 mm.

7. Copy the spur gear and move it accordingly such as the teeth have a line contact between them and now the Spur Gears are ready.



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