Worcester Polytechnic Institute

# Lab setup guide

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# Contents

# 1 Basebot

## 1.1 Bill of Materials

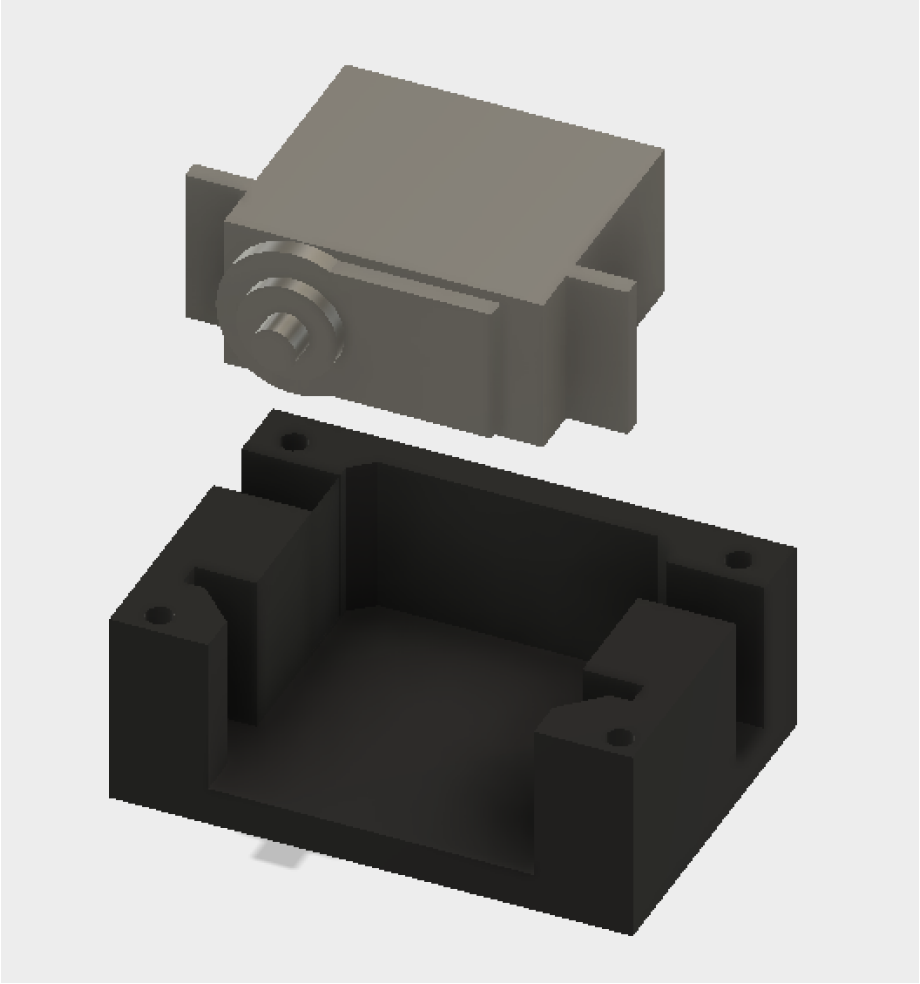
| General name | Item | Quantity | Cost per item | Total Cost |
|---|---|---|---|---|
| Motors | JX Servo PS-4806HB | 3 | $6.29 | $18.87 |
| Line sensor | TCRT5000 | 3 | $0.34 | $1.02 |
| Ultrasonic Sensor | HC-SR04 Ultrasonic Module | 1 | $1.50 | $1.50 |
| Breadboard | Breadboard | 1 | $0.95 | $0.95 |
| Hookup wires | Dupont connectors | 1 | $2.50 | $2.50 |
| Bluetooth Module | HC-05 | 1 | $2.47 | $2.47 |
| Wheels | servo wheel | 2 | $2.99 | $5.98 |
| Battery Pack | Holder for 6 x AA | 1 | $2.78 | $2.78 |
| Arduino nano | Arduino Nano | 1 | $2.49 | $2.49 |
| Breakout board | Shield For Arduino Nano | 1 | $1.62 | $1.62 |
| Potentiometer | 10K OHM Potentiometer | 1 | $0.13 | $0.13 |
| Bearings | 608 Bearings 8pcs/set | 1 | $3.00 | $3.00 |
| | | | Subtotal | $42.31 |

## 1.2 Parts to be 3d Printed

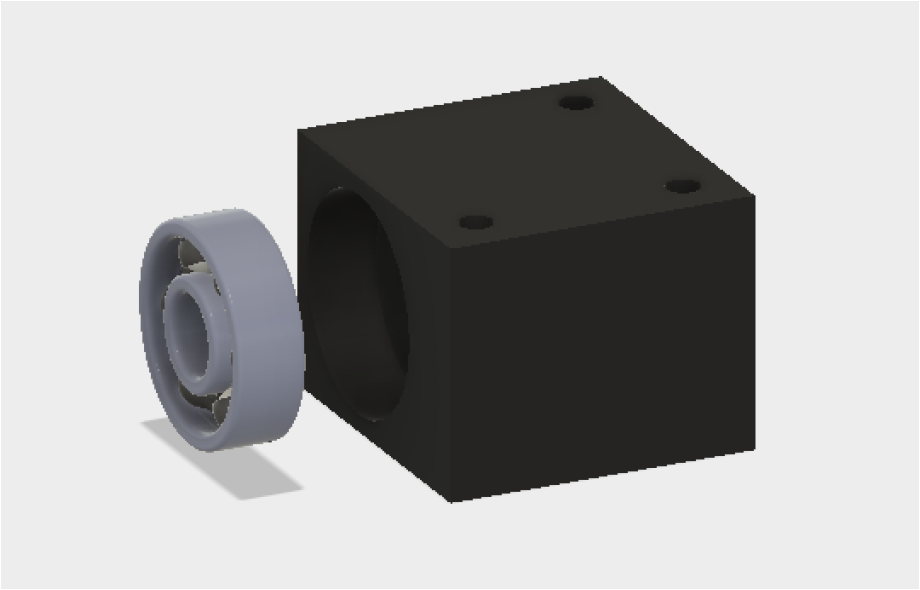
| Part Name | Quantity | Recommended Infill |
|---|---|---|
| Wheel Axle | 2 | 20% |
| Wheel | 2 | 20% |
| Drive Axle | 2 | 20% |
| Top | 1 | 10% |
| Bottom | 1 | 10% |
| Idler Block | 2 | 20% |
| Motor Mount | 2 | 20% |
| Gear | 4 | 20% |
| Idler Horn | 2 | 10% |
| Left Supporting wall | 1 | 20% |
| Right Supporting wall | 1 | 20% |

## 1.3 Assembly

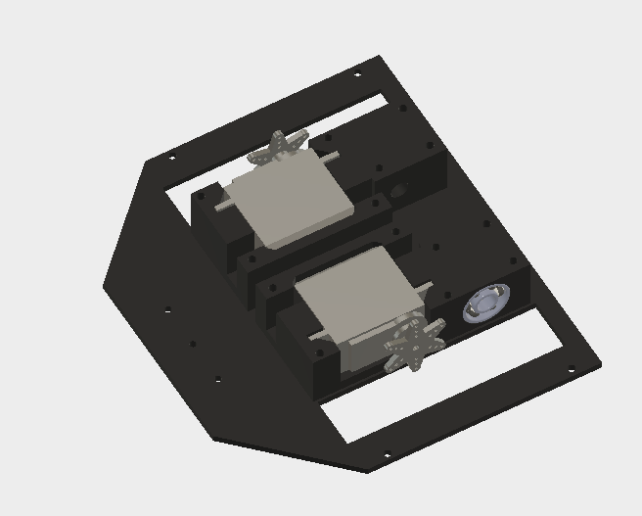
Begin by 3d printing all the components required for the assembly of the robot. Begin by mounting the motors into the motor mount by sliding them into place as seen below. Follow up by mounting the provided 6 spline servo horns onto the motors. then mount the printed gears to the servo horns using the screws that come with the motor.



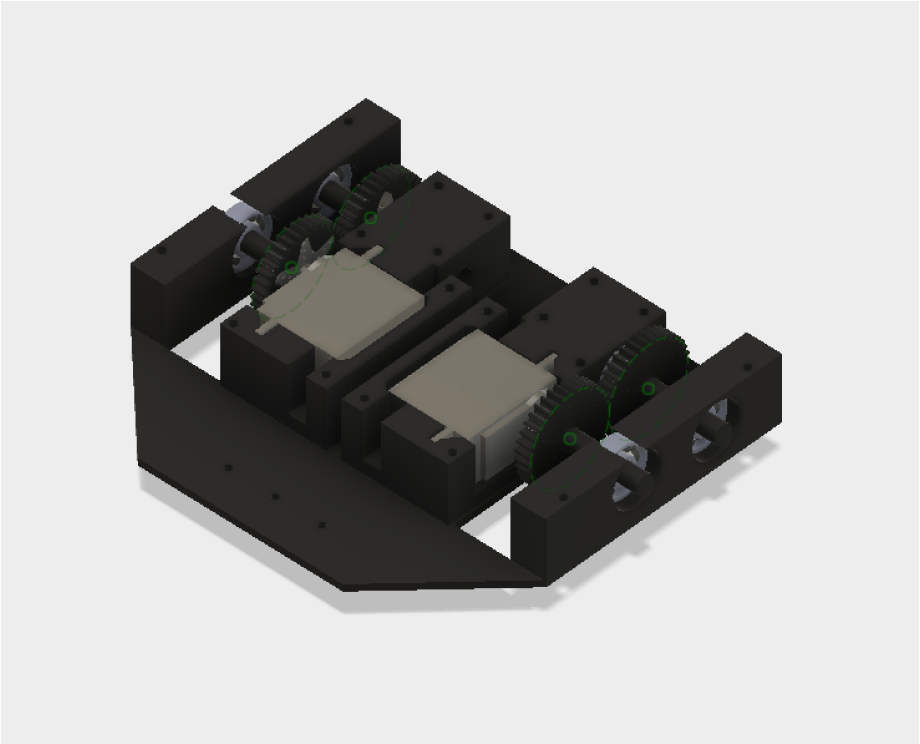
Continue by pressing the bearings into the left supporting wall, right supporting wall and idler blocks.



Now using the screw the motor mounts and idler blocks onto the bottom of the robot.



Mount the left and right supporting walls to the bottom of the robot. Push the drive axle through the support supporting walls as well as the drive axle. Add a gear and idler horn onto the wheel axle and push it through into the second bearing, aligning the gears. Mount the wheel to the wheel axle and add a drop of super glue to prevent the axle from slipping. The chassis should look like this.



Finish by mounting the Arduino shield to the top and the top of the robot finishing the chassis.