

Working with Machines & Materials

7.3. Tool List - Electronics/Mechatronics

S. No.	Item	Specifications	Quantity
1	Arduino UNO along with Cable	ATmega328P – 8-bit AVR family microcontroller, equivalent or better. Operating Voltage: 5V Digital I/O Pins: 14 (of which 6 provide PWM output) PWM Digital I/O Pins: 6 Accessories: Case shell enclosure, compatible USB cable (length - 6 inch or more)	4
2	Breadboard	Solderless 400-pin breadboard	4
3	DC Motor	12V DC Gear 150 RPM	4
4	DHT 11 sensor	Operating Voltage: 3.5V to 5.5V Operating current: 0.3mA (measuring) 60uA (standby) Output: Serial data Temperature Range: 0°C to 50°C Humidity Range: 20% to 90% Resolution: Temperature and Humidity both are 16-bit Accuracy: $\pm 1^\circ\text{C}$ and $\pm 1\%$	4
5	Digital MultiMeter	Digital Multimeter Voltage Current Resistance-7 functions + 19 ranges to cover DC voltage 200mV to 1kV,	4
6	Digital Pen Electric Tester	Voltage tester	4
7	ESP32	I2C, 1 wire, plug and play	4
8	Hand Tools Set	(Bits, Hammer, Hex, Keys, Knife, pliers, Ratchet, Screwdriver, Sockets, Spanners, Drilling machine and Bench Grinder)	2 sets
9	Handsaw	Size 6 inch	4

10	Hot Glue Gun	Works with standard 0.5-inch glue sticks. Temperature - 230 to 280 degrees Celsius.	4
11	Humidity Sensor	Operating range: 20 – 95 % RH Temperature: 0 - 60 Celsius Power supply: 1.5V AC (Max sine) Operating frequency: 500Hz - 2kHz	4

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12	I2C Module	Operating Voltage: 5V DC I2C control using PCF8574 Can have 8 modules on a single I2C bus I2C Address: 0X20~0X27 (the original address is 0X20, you can change it yourself via the onboard jumper pins)	4
13	IR Sensor	Board Size 3.2 x 1.4cm Working voltage 3.3 to 5V DC Operating voltage 3.3V: ~23 mA, to 5V: ~43 mA Detection range 2cm – 30cm (Adjustable using potentiometer) Active output level the output is “0” (Low) when an obstacle is detected	4
14	L298P Motor Driver	L298P Motor Driver Shield or relative Driver Shield	4
15	LCD Display	Dot matrix LCD display. 16 characters X 2 lines. I2C	4
16	MQ-5		4
17	PIR Sensor		4
18	Pliers: 4.5-inch size	Long Nose Plier External Straight	4
19	Precision Screwdriver Set	6 Piece Precision Screwdriver Set Types: PH0, PH1, Flat head - 1.4mm, 2mm, 2.4mm, 3mm	1
20	Relay	5V 10A - 2 Channel Relay Module. Compatible with Arduino.	4
21	Screwdriver	40 pc multi-purpose screwdriver set	4

22	7 Segment Display	LED 4-Digit Display Module Voltage Rating: 2.4V to 5.5V 4-Pin interface: Vcc, Gnd, Data, Clock	4
23	Servo Motor	Position Servo Angle based Metal Gear Small Servo Metal Gear Continuous Metal Gear Servo 360 Small Servo Plastic Gear	4
24	Soil Moisture Sensor	FC-28 with LM293 comparator Operating Voltage: 3.3V to 5V.	4
25	Soldering Helping hand	Specifications: Adjustable crocodile holding clamps/clip. Soldering iron holder. LED light. Magnifying lens.	4
S. No.	Item	Specifications	Quantity
26	Soldering Kit	Variable Wattage of Soldering Iron: 15-30 watts/230 volts 4 Equipment Soldering Iron Temperature Range: 280°C to 450°C Desoldering Pump, Soldering Flux (Paste) 100 grams, Desoldering Copper Braid (Solder Wick) - 1.5m*2mm Compatible Soldering Tip - Bevel, Chisel, Conical - 5 each per kit. Soldering Wire: 20/22 AWG soldering Wire with rosin core flux (100 Grams)	4
27	Ultrasonic Sensor Module HC04	Working Voltage - DC 5V Working current - 15 mA Working Frequency - 40 Hz Range - 1 cm to 4 m Effectual Angle - <15° Measuring Angle - 30° Resolution - 0.3 cm	4
28	Water Pump	DC12V 3W Submersible Water Pump	4
29	Wire Strippers	Wire Stripper Cutter Plier with Spring -26x6x20 cm (L x W x H)	4

*Quantity (for a class of 40 students)