ECE 1013 Part List

NOTE: Many of these items are found in various electronics starter kits at significant discounts!! Unfortunately, no single kit has every item we need, so if you choose to purchase a kit make sure you also acquire the remaining items on this list. For Arduino kits, any made for the Uno R3 will work, but you do still need one Uno R4 board.

Item Description	Qnty	Further Details & Recommended Part(s)
Handheld Digital Multimeter	1	• DC & AC Voltage (600+V), DC & AC Current (limit: 5+ Amps), Resistance (10+ MΩ), Continuity Test, Diode Test, Capacitance, Frequency & Duty Cycle, and Temperature, standard test leads. • optional features: Auto-Range, auto power off, extra leads (alligator clip style) • example: Multicomp Pro MP730988, from **Newark (part # 69AK8779)**
Wire Strippers	1	• Advised strip range: 16 to 26 AWG (must at least strip 22 AWG) • example: **Jameco part # 127871**
Pliers	1	• needle nose • example: **Jameco part # 2500327**
Flush Cutters		• insulated handle • example: **Jameco part # 2123320**
Tweezers	1	• (angled) • example: **Jameco part # 253092**
IC Tool	1	• for placing/removing Integrated Circuits • example: **Jameco part # 16838**

Soldering Supplies:

Item Description	Qnty	Further Details & Recommended Part(s)
Variable Temperature Soldering Iron & Rest Station	1	• adjustable temp (300–800 ˚F), heat-safe rest stand, heating power ≥ 35 W advised • Example: Stahl Tools STSSVT Variable Temperature Soldering Iron Station, from **Parts-Express (part # 374-100)**
Soldering Tips (Variety Pack)	1 (pk of 3+)	• must fit your soldering iron. Rec'd styles: 1x Standard Conical, 1x Small Conical, and 1x Chisel • Example: Stahl Tools SSRT 4-Piece Soldering Tip Kit for STSSVT, from **Parts-Express (part # 374-102)**
Helping Hands for Soldering	1	• a sturdy base with 3+ gooseneck-style flexible arms, and alligator clips to secure parts • example: **https://a.co/d/3kRbNHS**
Through-Hole Soldering Practice Kit	1	• a project-oriented practice kit for Through-Hole components • example: **https://a.co/d/ey26fW2**

SMT Soldering Practice Kit (OPTIONAL)	1	• practice kit for Surface Mount components
Protoboard for Soldering	1	• 0.1" grid spacing; independent plated holes; total size: at least 2" x 3" • example: 3 pack from **Adafruit, part # 4786**
~2+ ft of Solid Core Wire (22 AWG) (OPTIONAL)	1	• most often comes in a multipack of several feet. • example: **https://a.co/d/8AIbBLk**
Lead-Free Solder snack-sized (ha)	1	• Lead-Free; small quantity (tube or mini-roll) • example: **Jameco part # 170457**
Flux Pen	1	• No-clean flux type; squeeze- or press-dispensed • example: **Jameco part # 481764**
Flux Tub / Jar	1	• example: **Jameco part # 2246696**
Tip Tinner	1	• example: **Jameco part # 2112524**
Desoldering Braid/Wick (or Solder Sucker tool)	1	• twisted metal braid for de-soldering; suggested size: mini-roll • example: **Jameco part # 153462**
Brass Sponge + Base	1	• One brass sponge and a sturdy base, ideally slide resistant • example: **Jameco part # 156777**

Electronics Parts:

Uno R4 Minima	1	• example: **Jameco part # 2333871** • optional: can purchase the Uno R4 Wifi version instead (#2327207) , but its additional features are not discussed in lab.
USB-C Cable (M-to-M)	1	• example: Digikey part # 2987-DH-20UE0062-NH-ND
~6 inch Alligator Clip Jumpers	2+	• to simplify breadboard measurements. Can be Gator-to-Gator or Gator-to-Pin. Only needed if multimeter doesn't include them. • examples: https://a.co/d/36n1oU6 OR https://a.co/d/0exxyju
Breadboard & Jumper Wire Kit	1	• 800+ point breadboard, 2+ pairs of power rails, and various jumper wires • example: **Jameco part # 2134993**
SPDT Slide Switch (x2 per kit)	2	• through-hole; breadboard compatible; 3 pins; Vertical orientation; 2 positions, "on-on"; at least 300+ mA limit, 25+ V • example: **Jameco part # 2258831**
DIP Switch (3+ switches)	1	• through-hole; breadboard compatible; 3 Slides, all STST; rated for at least 24+ V and 25+ mA • example: **Jameco part # 2286423**
Low Profile Tactile Buttons	4	• through-hole; breadboard compatible; low-profile; SPST normally-open, momentary tactile switch; 2 pins on each switch. • example: **Jameco part # 2279527**
Tall Tactile Buttons	6	• through-hole; breadboard compatible; tall profile; SPST normally-open, momentary tactile switch; 4 pins on each switch. • example: **Jameco part # 2328079**

27 Ω Resistors	10	• through-hole; axial package; Power: 1/4 W; Tolerance: 5% • example: **Jameco part # 690486**
220 Ω Resistors	10	• through-hole; axial package; Power: 1/4 W; Tolerance: 5% • example: **Jameco part # 690700**
330 Ω Resistors	10	• through-hole; axial package; Power: 1/4 W; Tolerance: 5% • example: **Jameco part # 690742**
4.7 kΩ Resistors	10	• through-hole; axial package; Power: 1/4 W; Tolerance: 5% • example: **Jameco part # 691024**
10 kΩ Resistors	10	• through-hole; axial package; Power: 1/4 W; Tolerance: 5% • example: **Jameco part # 691104**
10 kΩ Photoresistor / LDR (x2 each)	2	• through-hole; ~10 kΩ value; • example: **Jameco part # 120301**
~10 kΩ NTC Thermistor	2	• through-hole; disc package; NTC type, with ideally ≤ 5% tolerance • example: **Jameco part # 207037**
~10 kΩ Potentiometer (x3 each)	3	• through-hole; breadboard compatible; ~10 kΩ value; linear change; single-turn; vertical knob • example: **Jameco part # 2291071**
47 μF Electrolytic Capacitor	10	• through-hole; radial package; rated ≥ 30V • example: **Jameco part # 330820**
1,000 μF Electrolytic Capacitor	10	• through-hole; radial package; rated ≥ 30V • example: **Jameco part # 2316039**
0.01 μF Ceramic Capacitor	10	• through-hole; disc package; rated ≥ 30V • example: **Jameco part # 2301271**
0.1 μF (or 100 nF) Ceramic Capacitor	10	• through-hole; disc package; rated ≥ 30V • example: **Jameco part # 2300983**
1n4003 Diodes	10	• through hole; axial package • example: **Jameco part # 76970**
Diffused Red 5mm LED	10	• through-hole; ~20 mcd brightness; • example: **Jameco part # 697522**
Diffused Green 5mm LED	5	• through-hole; ~20 mcd brightness • example: **Jameco part # 2329271**
Diffused Blue 5mm LED	5	• through-hole; ~10-20 mcd brightness • example: **Jameco part # 138691**
Diffused RGB 5mm LED	1	• through-hole; common-cathode type; • example: **Jameco part # 2219559**
2n2222 PNP Transistors	2	• through-hole; TO-92 package • example: **Jameco part # 28628**
2n2907 PNP Transistors	2	• through-hole; TO-92 package • example: **Jameco part # 28644**
IRLZ44 Logic-Level N-Channel MOSFET	1	• through-hole; TO-220 package; logic-level; N-Channel • example: **Jameco part # 1563905**

LM317 Adjustable Linear Voltage Regulator	1	• through-hole • example: **Jameco part # 23579**
2-Row LCD (with header pins)	1	• through-hole; breadboard compatible (0.1" lead spacing) • example: **Jameco part # 2333231**
Passive Infrared Motion Sensor	1	• example: **https://a.co/d/b8DmjSr**
DHT11 or DHT22 Temp/Humidity Sensor	1	• example: **https://a.co/d/2gwK2Pm**
HC-SR04 Ultrasonic Sensor	1	• example: **https://a.co/d/5ns3GAo**
Microservo	1	• 5v micro servo motor • example: **Jameco part # 2214601**
Geared DC Motor	1	• 3-6 V geared DC motor; most often comes in multipacks. • example (this one includes the L298N module needed below): **https://a.co/d/hg04VMz**
28BYJ-48 Stepper Motor	1	• often comes in multipacks. May include a different motor driver, but it is not required or used in these labs. The L298N is preferred.
L298N Dual Channel H-Bridge Motor Driver Module	1	• one needed, but usually comes in packs of 2 or more • example (4-pack): **https://a.co/d/i3Z8PIE**
CD4017 Decade Counter IC	1	• through-hole; DIP-16 • example: **Jameco part # 12749**
NE555 Timer IC	1	• through-hole; DIP-8 • example: **Jameco part # 27422**
556 Timer IC (Dual 555)	1	• through-hole; DIP–14 • example: **Jameco part # 904114**
CD40106 Inverting Hex Schmidt Trigger IC	1	• through-hole; DIP-14 • example: **Jameco part # 893179**
MCP23017 I/O Expander IC for I2C	1	• through-hole; DIP-28 • example: **Digikey part # MCP23017-E/SP-ND**
8-Pin DIP socket	1	• example: **Jameco part # 526299**
14-Pin DIP socket	2	• example: **Jameco part # 112214**
16-Pin DIP socket	1	• example: **Jameco part # 2246080**
28-Pin DIP socket	1	• example: **Jameco part # 112299**
Male Header Pins (4-6 pins)	1	• example: **Jameco part # 2295895**