ECTE250 Kit and Equipment

Each ECTE20 team has 900 AED budget to purchase parts for prototyping.

All teams are provided with a standard kit worth 600 AED, which includes:

- Arduino/Genuino Starter Kit (it includes many parts https://www.arduino.cc/en/Main/ArduinoStarterKit)
- Arduino Ethernet shield
- Large breadboard
- Perfoboard
- Ethernet cable

Teams will receive this kit from the Lab Engineer Mr. Majid Munawar (MajidMunawar@uowdubai.ac.ae) at the beginning of the laboratory on Autumn Week 3. Upon receiving the kit, teams have to fill and sign a form and pay a security deposit to the Lab Engineer. The deposit will be returned at the end of the session if all parts are returned in good working conditions. This also includes those parts requested at later during the session. Teams will be provided with a locker in Block 5 in which they can securely store their parts and kit.

The provided kit is not sufficient to implement a prototype fulfilling all requirements. Indeed, the remaining 300 AED can be spent to purchase additional components. The components can be purchased from the following list. Stating price in AED and the maximum quantity of individual components allowed in each prototype. To purchase components, fill the related form on Moodle and send it to the Lab Engineer, which will pass you the ordered parts in up to 7 calendar days. Teams are requested to keep track of the budget spent for parts (the Lab Engineer will do the same on his side). The first time you damage a component, you can replace it for free. Any subsequent time you will be charged the price stated in the list.

Standard Parts	**Max Quantity per Project**	**Price (AED)**
NE555 timers	2	5
TL074/LF347 opamps	4	6
TL071/LF351 opamps	4	5
74LS00 (Quad 2-input NAND gate)	4	4
74HC02 (Quad 2-input NOR gate)	4	4
74LS04 (HEX inverter gate)	4	4
74LS08 (Quad 2-input AND gate)	4	4
74HC74 (Dual D type flip flops)	4	4
74HC86 (Quad 2-input XOR)	4	4
74LS90 (Decade Counter)	2	5
74LS73 (Dual JK type flip flops)	4	8
74HC151 (8 input multiplexer)	2	5
74HC138 (3-to-8 demultiplexer)	2	5
74HC161 (4 bit binary counter)	2	6
74HC164 (8 bit serial in parallel out shift register)	2	5

74HC132 (Quad 2 input NAND gate Schmitt Trigger)	4	8
BC557 (PNP transistors, complement BC547 NPN in Arduino Kits)	5	2
IRF9532 (P-Channel MOSFET, to complement IRF520 N-Channel MOSFET in Arduino Kits)	2	5
5 Volt SPST DIL Reed Relay	4	8
BD139 (NPN transistor for push pull circuit)	2	4
BD140 (PNP transistor for push pull circuit)	2	4
7805 (+5 VDC Voltage regulator, 1 amp)	4	4
LM2936 (+3.3V Voltage regulator 50mA, input 4-26Volts DC)	2	8
ULN2003 (Darlington pairs array IC)	1	9
BD649 (NPN Darlington pair)	2	8
BD650 (PNP Darlington Pair)	2	8
1N4728 (3.3V Zener diode)	4	2
1N4732 (4.7V Zener diode)	4	2
1N4743 (13V Zener diode)	4	2
8 position DIP Switch	1	4

Teams can use in their design at most one part not included in this list or in the kit. The extra part must be an analog sensor or actuator approved from the Mentor, and requested by Autumn Week 13. The sensor can be sourced from those already in store (see the table below) or purchased externally. For more details, approach the Mentor.

Special Parts: Analog Sensors and Actuators	**info**	**Price (AED)**
Linear rotary potentiometer 10k ohm	https://www.sparkfun.com/products/9288	5
Electret microphone with MAX9814 amplifier	https://www.adafruit.com/products/1713	30
Moisture sensor	https://www.sparkfun.com/products/13322	25
Light variable resistor	https://www.sparkfun.com/products/9088	10
Infrared Proximity Sensor	https://www.sparkfun.com/products/8958	45
Pressure sensor (round 25 lbs)	https://www.sparkfun.com/products/8712	80
Thin Film Piezo Electric Sensor	http://www.thanksbuyer.com/meas-meas-spec-com-piezo-vibration-sensor-thin-film-high-sensitivity-ac-coupling-37169	25
Two axis thumb joystick	https://www.adafruit.com/product/512	30
Round force sensitive resistor	https://www.adafruit.com/product/166	25
Flex Sensor	https://www.sparkfun.com/products/12859	30
Ceramic Piezo Sensor/Actuator	https://www.sparkfun.com/products/10293	10
3 Axis Accelerometer	https://www.sparkfun.com/products/9267	60
Solenoid	http://www.robotshop.com/en/5v-solenoid.html	25
Vibration motor	https://www.sparkfun.com/products/8449	40

For prototyping, teams can use the following equipment available in KV5-139 Circuit Lab, for which there is no need to budget for:

- Dual Channel Power supply (to be used as +/- 15 V, 150 mA max source)
- Soldering equipment (iron, glasses, third hand)
- Wire cutter/stripper
- Two Channels Oscilloscope
- Signal Generator
- Multimeter
- Dedicated ECTE250 Network

For prototyping, teams can use the following consumables available in KV5-139 Circuit Lab, for which there is no need to budget for (however, use these wisely):

- Passive components (resistors, capacitors)
- Wires
- Integrated circuits sockets
- Screw Terminal
- Soldering Paste and Soldering Wire

It is strictly forbidden to use other parts, equipment, or tools sourced elsewhere.

It is strictly forbidden to store in lockers any consumable or equipment, as this may prevent a fair share of these resources with other teams, or with students from other subjects. **Lockers will be inspected weekly** by the Lab Engineer.

Violators will have deliverable marks reduced by up to 50% per incident.