EduvanceAR

Learning Electronics using Augmented Reality
Resistor

Learning Outcomes:

1. The basics of resistance, its units and Ohm’s law
2. The types of resistors, their composition and their power rating.
3. Reading the value of the resistor using the colour bands on them and calculating total resistance when they are placed in series and parallel.

Getting started:

Open the EduvanceAR app on your mobile phone and scan the Eduvance logo on the top left corner.
Learning Outcomes:

1. The basics of capacitance, its units and introduction to capacitor.
2. The types of capacitors, their working and calculation of charge, current and voltage.
3. Calculation of total capacitance when capacitors are placed in series and parallel.

Getting started:

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Learning Outcomes:

1. The basics of inductance, its units, laws of inductance and introduction to inductors.
2. The types of inductors - air core and ferromagnetic core and how they are made.
3. Concept of self-inductance and mutual inductance.
4. Calculation of inductance when it is placed in series and how it is affected by self and mutual inductance.

Getting started:

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Learning Outcomes:

1. Semiconductor basics, how a diode is represented in a circuit, direction of flow of current.
2. How a diode works, forward biasing and reverse biasing of a diode and Peak Inverse Voltage.
3. Different type of diodes- Zener diode, Varactor diode, Schottky diode.

Getting started:

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Learning Outcomes:

1. Semiconductor basics, introduction and working of diode.
2. Working of LEDs, material used to make LED, LED electrodes and their polarity.
3. Advantages of using LEDs, applications and where they can be used, and important tips before LEDs are used in a circuit.

Getting started:

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Learning Outcomes:

1. Concept and visual structure of Seven Segment Displays (SSDs) and their implementation.
2. How multiple digits are displayed simultaneously, configurations in which SSD is used.
3. Displaying on SSDs and applications where SSD are used.

Getting started:

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Learning Outcomes:

1. Introduction to relay and how it operates.
2. Pin connections of relay.
3. Concepts of pole and throw, concept of normally open (NO), normally closed (NC) and change over (CO) in relays.
4. Factors to consider while selecting a relay.

Getting started:

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Learning Outcomes:

1. How to use a Digital Storage Oscilloscope.
2. Function of the knobs on the front panel.
3. Using the time scale and voltage scale to scale the waveform.
4. Function of buttons on front panel such as CH1, CH2, Menu, Math.

Getting started:

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Learning Outcomes:

1. How to use a Digital Multimeter.
2. Parts of the Digital Multimeter such as a display, knob, ports where the measuring probes are connected.
3. Measuring voltage, resistance, current (DC and AC)
4. Checking continuity in a circuit, finding small signal forward current gain of a bipolar transistor using multimeter.

Getting started:

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Learning Outcomes:

1. Basics of Spectrum Analyser and how to use it.
2. Understanding the display and scale of signals displayed.
3. Function of buttons on the front panel such as span, ampl, peak, BW and using the knob and numeric keypad for selecting options.

Getting started:

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Learning Outcomes:

1. Using a signal Generator.
2. Setting the frequency desired as output using the knobs and selecting the right frequency range.
3. Functions on the front panel such as symmetry, DC offset.
4. Getting different types of waveforms like Square wave, Sinusoidal wave, triangular waveform.

Getting started:

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Learning Outcomes:

2. Function of the on board components like RGB LED, Status LED, accelerometer, capacitive touch sensor.
3. Core of the SoC, crystal oscillator and I/O ports.
4. Using USB connectors and Open SDA ports.

Getting started:

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Learning Outcomes:

1. Components on the Cypress PSoC 4 BLE board like capacitive touch sensor, switch, RGB LED, status LED.
2. Introduction to the BLE module on board.
3. Core of the PSoC, crystal oscillator and I/O ports.
4. Using USB connector and function of PSoC 5.

Getting started:

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Learning Outcomes:

1. Introduction to the Quanser QUBE-Servo 2.
2. Its working and interface option available.
3. Features of Quanser QUBE-Servo 2.

Getting started:

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Learning Outcomes:

1. Introduction to the Quanser Rotary Inverted Pendulum module.
2. Working of the inverted pendulum.

Getting started:

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Learning Outcomes:

1. Components on the FRDM K64F board.
2. Function of the on board components like RGB LED, Status LED, accelerometer, clocking.
3. Microcontroller, Reset button and I/O ports.
4. Using USB connectors and Open SDA ports.

Getting started:

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Learning Outcomes:

1. Components on the Cypress FM4 S6E2CC board.
2. Function of the on board components like RGB LED, CMSIS-DAP, accelerometer, light sensor and user button.
3. Microcontroller, Ethernet port and I/O ports.
4. Using USB direct and headphone codec ports.

Getting started:

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Cypress
PSoC 4 Pioneer

Learning Outcomes:

2. Function of the on board components like RGB LED, Status LED, accelerometer, capacitive touch sensor.
3. Core of the SoC-PSoC 4, PSoC 5 LP and I/O ports.
4. USB connector and power supply.

Getting started:

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Learning Outcomes:

1. Components on the Cypress PSoC 4M board.
2. Function of the on board components like RGB LED, Status LED, accelerometer, capacitive gesture pad, light sensor, temperature sensor.
3. Core of the SoC-PSoC 4200M, PSoC 5 LP, I/O ports, F-RAM.
4. USB connector and power supply.

Getting started:

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Learning Outcomes:

2. Function of the microcontroller, external power supply jack.
3. Function of power pins, digital pins, analog pins.
4. USB interface, user LED and communication.

Getting started:

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Learning Outcomes:

1. Components on the STM32 Nucleo board and the cuttable PCB.
2. Function of the on board components like Arduino connectors, COM LED, user LED, reset button.
3. Current measurement.
4. USB connector and power supply.

Getting started:

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Learning Outcomes:

1. Introduction to NRF24L01.
2. RF channel frequency and air data rate, pinout connections of the module.
3. Power down mode, standby mode, RX mode and TX mode.
4. Multiceiver feature of NRF.

Getting started:

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Raspberry Pi 3

Learning Outcomes:

1. Introduction to Raspberry Pi 3 board.
2. Core used, hardware features, peripherals, GPIO, USB Port, HDMI interface.
3. Supply sequencing, power sequencing, booting.
4. SDIO Interface, camera serial interface, display serial interface.
5. Thermals and temperature range.

Getting started:

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Learning Outcomes:

1. Introduction to STM32 Discovery board.
2. Features, USB Connector, on board audio capabilities.
3. MEMS E-compass, Gyroscope.
4. Communication LED, User LED and USB LED.
5. Reset Button and USB Button.

Getting started:

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