TRC 2020 Video Guide

|  |  |
| --- | --- |
| Module 1 | Electronics Fundamentals |
| Description | This module emphasizes safety and extra caution in dealing with electronics |
| Videos | 1. Electrical Safety  2. Introduction to Electronics  3. Basic Electrical Components  4. Digital Multimeter |
| Materials | * LED’s * Breadboard Power Supply Module * 12V Adapter * Digital Multimeter * Resistors * Jumper Wires * Breadboard |
| Helpful Links | None |
| Instructor | Veenna Barnachea |

|  |  |
| --- | --- |
| Module 2 | Electronics Laboratory |
| Description | First hands on exercises with electronics |
| Videos | 1. Breadboarding  2. Soldering |
| Materials | * LED’s * Breadboard Power Supply Module * 12V Adapter * Digital Multimeter * Resistors * Jumper Wires * Breadboard * Soldering Iron and Lead |
| Helpful Links | None |
| Instructor | Veenna Barnachea |

|  |  |
| --- | --- |
| Module 3 | Introduction to Microcontroller (Basic) |
| Description | This module introduces you to Bluno Mega (Arduino based Microcontroller with built in Bluetooth) |
| Videos | 1. Introduction to Microcontrollers |
| Materials | * LED’s * Resistors * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | <https://www.arduino.cc/> - to download Arduino Software  <https://wiki.dfrobot.com/Bluno_Mega_2560__SKU_DFR0323_> |
| Instructor | Veenna Barnachea |

|  |  |
| --- | --- |
| Module 4 | Logic and Program Flow |
| Description | This module introduces you to Arduino Programming syntax and logic to make your own Arduino sketches |
| Videos | 1. Arduino Blink Code  2. Arduino Variables  3. Arduino Function and Control Structure |
| Materials | * Bluno Mega * USB Micro Cable * Laptop with Arduino IDE |
| Helpful Links | <https://trc2020.thinklab.ph/> |
| Instructor | Mark Jayson De Jesus |

|  |  |
| --- | --- |
| Module 5 | Serial Communication |
| Description | This module introduces you to Arduino Serial Communication (UART) |
| Videos | 1. Arduino Serial Communication |
| Materials | * Bluno Mega * USB Micro Cable * Laptop with Arduino IDE |
| Helpful Links | <https://trc2020.thinklab.ph/> |
| Instructor | Mark Jayson De Jesus |

|  |  |
| --- | --- |
| Module 6 | Digital Output |
| Description | This module introduces you to Arduino Digital Output |
| Videos | 1. Arduino Digital Output |
| Materials | * LED’s * Buzzer * Speaker * Resistors * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | <https://trc2020.thinklab.ph/> |
| Instructor | Mark Jayson De Jesus |

|  |  |
| --- | --- |
| Module 7 | Digital Input |
| Description | This module introduces you to Arduino Digital Input and tact switches |
| Videos | 1. Arduino Digital Input |
| Materials | * LED’s * Tact Switches * Resistors * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | <https://trc2020.thinklab.ph/> |
| Instructor | Mark Jayson De Jesus |

|  |  |
| --- | --- |
| Module 8 | Analog Output |
| Description | This module introduces you to Arduino Analog Output (Pulse Width Modulation) |
| Videos | 1. Arduino Analog Output |
| Materials | * LED’s * Resistors * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | <https://trc2020.thinklab.ph/> |
| Instructor | Mark Jayson De Jesus |

|  |  |
| --- | --- |
| Module 9 | Sensor Basic |
| Description | This module will guide you how to accept sensor value using analog input pins |
| Videos | 1. Arduino Analog Input |
| Materials | * LED’s * Potentiometer * Digital Multimeter * Resistors * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020) |
| Instructor | Roland Jay Miguel |

|  |  |
| --- | --- |
| Module 10 | Sensor Interfacing |
| Description | This module introduces you to interface and experiment with other sensors |
| Videos | 1. Proximity Sensor  2. Rotary Encoder  3. Tilt Sensor |
| Materials | * LED’s * Digital Multimeter * Resistors * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE * Infrared Sensor * Rotary Encoder |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020) |
| Instructor | Roland Jay Miguel |

|  |  |
| --- | --- |
| Module 11 | Actuators: Moving your robot |
| Description | This module explains how a robot moves and what you will be making on the next following videos |
| Videos | 1. Moving your Robot |
| Materials | None |
| Helpful Links | <https://trc2020.thinklab.ph/> |
| Instructor | Arnel Domingo |

|  |  |
| --- | --- |
| Module 12 | Actuators: Motors and Power |
| Description | This module explains and discuss how to work with compatibilities relating to motors, drivers and power requirement |
| Videos | 1. Motors and Power |
| Materials | None |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020) |
| Instructor | Arnel Domingo |

|  |  |
| --- | --- |
| Module 13 | Actuators: Motor Drivers |
| Description | This module will guide you how Motor Driver works |
| Videos | 1. Motor Drivers |
| Materials | * Motor Driver * Digital Multimeter * Resistors * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020) |
| Instructor | Arnel Domingo |

|  |  |
| --- | --- |
| Module 14 | Actuators: DC Motor |
| Description | This module will guide you how to interface DC Motor to Arduino |
| Videos | 1. How to Use Brushed DC Motors |
| Materials | * 6V DC Motor * 6V Motor Driver * Breadboard Power Supply Module * 12V Adapter * Digital Multimeter * Resistors * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020) |
| Instructor | Arnel Domingo |

|  |  |
| --- | --- |
| Module 15 | Actuators: Servo Motors |
| Description | This module will guide you how to interface multiple Servo Motors |
| Videos | 1. How to Use Servo Motors  2. How to Use 16 PWM Servo Driver |
| Materials | * Servo Motor * PWM Servo Driver * Breadboard Power Supply Module * 12V Adapter * Digital Multimeter * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020) |
| Instructor | Arnel Domingo |

|  |  |
| --- | --- |
| Module 16 | Actuators: Stepper Motors |
| Description | This module will guide you how to use Stepper Motors |
| Videos | 1. How to Use Stepper Motors |
| Materials | * Stepper Motor * Stepper Driver * Breadboard Power Supply Module * 12V Adapter * Digital Multimeter * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020) |
| Instructor | Arnel Domingo |

|  |  |
| --- | --- |
| Module 17 | Actuators: Brushless DC Motors |
| Description | This module will guide you how Brushless DC motors |
| Videos | 1. Brushless DC Motors Safety  2. Introduction to Brushless DC Motors  3. How to Use Brushless DC Motors |
| Materials | * Brushless DC Motor * Motor Driver * 24V Battery * Digital Multimeter * Bluno Mega * USB Micro Cable * Jumper Wires * Breadboard * Laptop with Arduino IDE |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020) |
| Instructor | Arnel Domingo |

|  |  |
| --- | --- |
| Module 18 | Robot Control: Introduction to Wireless Control |
| Description | This module will Introduce you to different wireless technology and how can it help with your robot build |
| Videos | 1. Wireless Control Introduction |
| Materials | None |
| Helpful Links | None |
| Instructor | Veenna Barnachea |

|  |  |
| --- | --- |
| Module 19 | Robot Control: Bluetooth |
| Description | This module will guide you how to configure you Bluetooth devices and communicate with each other |
| Videos | 1. Bluetooth Configuration  2. Bluetooth Control |
| Materials | * LED’s * Digital Multimeter * Resistors * Bluno Mega * BLE Link Module * 2 x USB Micro Cable * Jumper Wires * Breadboard * Wireless Joystick Controller * 3 x AAA Batteries * Joystick USB Adapter * Laptop with Arduino IDE |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020)  <https://wiki.dfrobot.com/BLE-Link__SKU_TEL0073_> |
| Instructor | Peter Mark Dela Cruz |

|  |  |
| --- | --- |
| Module 20 | Robot Control: WiFi |
| Description | Introduce you to ESP32 Module, it will guide on how to connect your devices thru the use of WiFi |
| Videos | 1. WiFi Configuration  2. WiFi Control |
| Materials | * LED’s * Breadboard Power Supply Module * 12V Adapter * Digital Multimeter * Resistors * ESP32 Module * USB Micro Cable * Jumper Wires * Breadboard * Servo Motor * Laptop with Arduino IDE |
| Helpful Links | [https://trc2020.thinklab.ph/](https://github.com/thinklabph/trc2020)  <https://randomnerdtutorials.com/getting-started-with-esp32/> |
| Instructor | Peter Mark Dela Cruz |