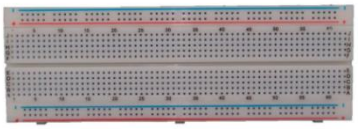
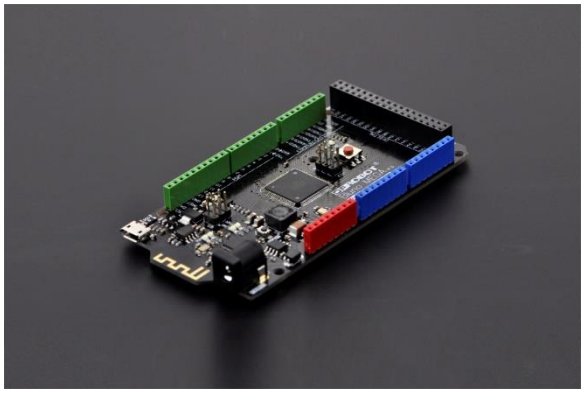
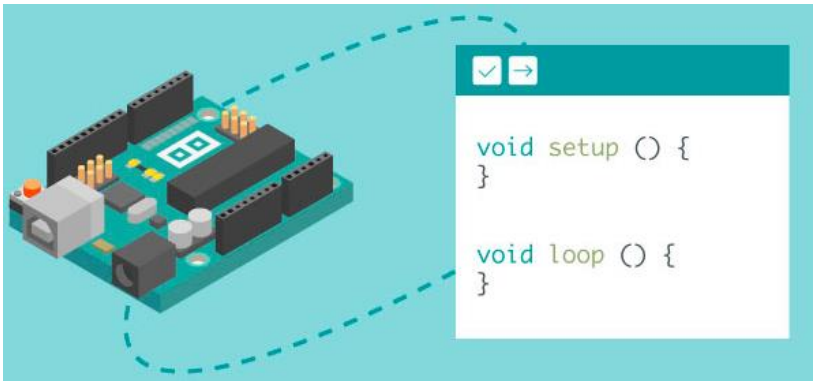
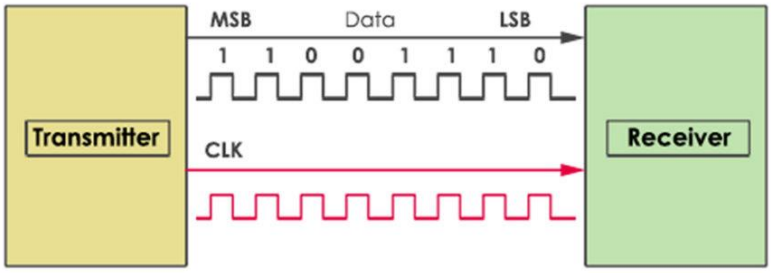
TRC 2020 Video Guide

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

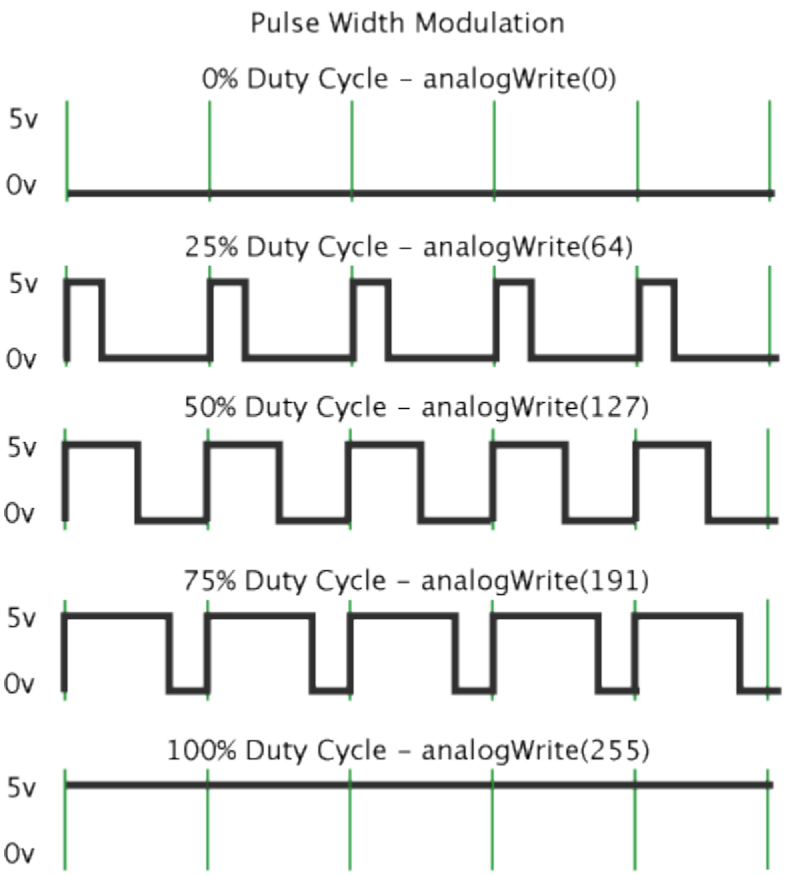
Module 3	Introduction to Microcontroller (Basic)
Description	This module introduces you to Bluno Mega (Arduino based Microcontroller with built in Bluetooth) 
Videos	1. Introduction to Microcontrollers
Materials	• LED's • Resistors • Bluno Mega • USB Micro Cable • Jumper Wires • Breadboard • Laptop with 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

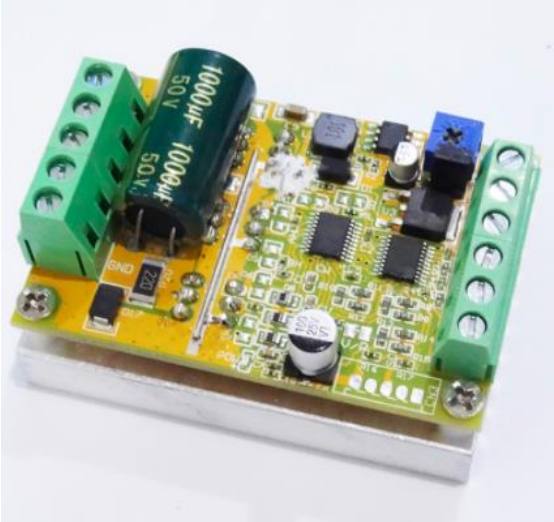
Module 8	Analog Output
Description	This module introduces you to Arduino Analog Output (Pulse Width Modulation) 
Videos	1. Arduino Analog Output
Materials	• LED's • Resistors • Bluno Mega • USB Micro Cable • Jumper Wires • Breadboard • Laptop with Arduino IDE
Helpful Links	https://trc2020.thinklab.ph/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

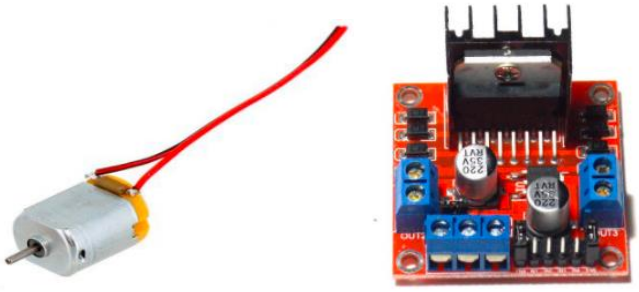
Module 9	Sensor Basic
Description	This module will guide you how to accept sensor value using analog input pins 
Videos	1. Arduino Analog Input
Materials	• LED's • Potentiometer • Digital Multimeter • Resistors • Bluno Mega • USB Micro Cable • Jumper Wires • Breadboard • Laptop with Arduino IDE
Helpful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

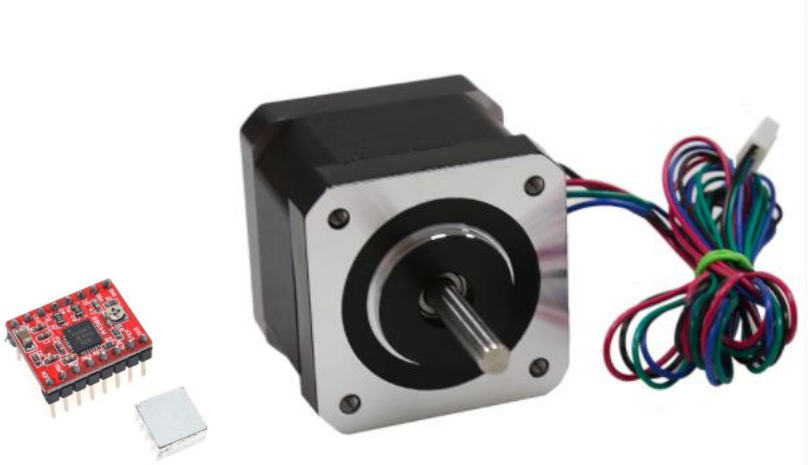
Module 11	Actuators: Moving your robot
Description	This module explains how a robot moves and what you will be making on the next following videos
Videos	1. Moving your Robot
Materials	None
Helpful Links	https://trc2020.thinklab.ph/
Instructor	Arnel Domingo

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/
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/
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/
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/
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/
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/
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://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://randomnerdtutorials.com/getting-started-with-esp32/
Instructor	Peter Mark Dela Cruz