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| **Raspberry pi training module** | | | |
| S.no | Topic | Learning resources (Theory) | Task list (practical’s) |
|  | Introduction to RASPBERRY PI, Features of RASPBERRY PI, Introduction To The NOOBS Software | <https://pythonprogramming.net/introduction-raspberry-pi-tutorials/>  <https://www.electronicwings.com/raspberry-pi/raspberry-pi-gpio-access>  <https://www.educba.com/raspberry-pi-3-vs-arduino/>  Topics covered:  Introduction raspberry pi, Pin out, FEATURES of raspberry pi, Differentiate raspberry pi with other controller | * Install the NOOBs os raspberry pi and setup the raspberry pi desktop. * Summarize the difference between Arduino and raspberry pi. |
|  | Introduction to Python, Structure of Python program, Basic example programming with RASPBERRY PI | <https://www.youtube.com/watch?v=PyxQPXsvehw>  <https://core-electronics.com.au/tutorials/raspberry-pi-workshop-for-beginners.html>  <https://pypi.org/project/mcp3208/>  Topics covered:  Basic python programming, GPIO interface with raspberry pi. | * Write a python basic GPIO programs in raspberry and observe the physical output * Write a program for interfacing the DC motor, servo, and relay with raspberry pi and check the physical output. * Mcp3208 interface with raspberry pi. |
|  | Program For RASPBERRY PI Interfacing sensor | <https://www.electronicwings.com/raspberry-pi/dht11-interfacing-with-raspberry-pi>  <https://www.electronicwings.com/raspberry-pi/pir-motion-sensor-interfacing-with-raspberry-pi>  <https://www.electronicwings.com/raspberry-pi/mpu6050-accelerometergyroscope-interfacing-with-raspberry-pi>  Topics covered:  Raspberry pi interface with DHT11 Sensor, PIR Sensor, mpu6050 | * Write a program for Practice the following sensor (DHT11 Sensor, PIR Sensor, MPU6050) interfacing with raspberry pi and check the physical output. |
|  | Interfacing LCD with raspberry | <https://iot-guider.com/raspberrypi/16x2-character-lcd-in-raspberry-pi-using-python/>  <https://www.electronicshub.org/interfacing-16x2-lcd-with-raspberry-pi/#:~:text=The%20design%20of%20the%20circuit,is%20the%20contrast%20adjust%20pin>.  Topics covered:  Interfacing LCD in 4-bit mode with raspberry pi | * Write a program for Interfacing LCD in 4-bit mode with raspberry pi |
|  | Serial communication, How to transmit/receive a character using serial port, Programming on GSM with RASPBERRY PI to read SMS/ sent SMS. | <https://www.rhydolabz.com/wiki/?p=15764>  <https://www.rhydolabz.com/wiki/?p=10868>  <https://www.rhydolabz.com/wiki/?p=11385>  <https://www.rhydolabz.com/wiki/?p=10450>  <https://www.rhydolabz.com/wiki/?p=9557>  Topics covered:  Transmit/receive a character & String using raspberry pi | * Write a program for transmitting a char and receive a char and check the physical output. * Write a program for transmitting a string and receive a string and check the physical output. * Write a program for home automation using zigbee * Write a program to send & receive sms using raspberry pi with GSM * Gps interface with raspberry pi |
|  | Introduction to the different IOT cloud servers, Introduction about push method and get method, Sensor data sending to things speak cloud server | <https://www.avsystem.com/blog/iot-cloud-platform/>  <https://www.hivemq.com/blog/mqtt-essentials-part-3-client-broker-connection-establishment/>  <https://medium.com/nlgn/http-push-and-pull-introduction-nlogn-c726c012662>  <https://www.factoryforward.com/upload-sensor-data-thingspeak-using-nodemcu/>  <https://electronicshobbyists.com/raspberry-pi-sending-data-to-thingspeak-simplest-raspberry-pi-iot-project/>  Topics covered:  Introduction to IOT, protocols, push, get method, Sensor data sending to things speak cloud server | * Write a program for transmitting DHT11sensor data to things speak server. |
|  | Data receiving from adafruit.IO cloud server | <https://www.electronics-lab.com/project/getting-started-with-adafruit-io-iot-cloud-platform/>  Topics covered:  Sensor data transfer to ada fruit. | * Write a program for ada fruit interface with raspberry pi. |
|  | Embedded applications | We have provided Reference code | * Home automation using IOT * IOT based Weather monitoring system |