

Techno India NJR Institute of Technology, Udaipur

Internet Of Things

Training Module

Total Time: 1 Month

Internet of Things	
Module 1	What Is the Internet of Things (IoT)?
Lecture 1	Basic Introduction Of IOT.
Lecture 2	IoT Devices & Examples.
Lecture 3	IoT Devices vs. Computers.
Lecture 4	Trends in the Adoption of IoT.
Lecture 5	IoT Is Powerful and Pervasive.
Lecture 6	Societal Benefits of IoT.
Lecture 7	Risks, Privacy, and Security.
Module 2	Embedded Systems
Lecture 1	What Are Embedded Systems?
Lecture 2	More on Embedded Systems.
Lecture 3	Generic Embedded Systems Structure.
Lecture 4	Components of Embedded Systems.
Lecture 5	Introduction Of Processor and Controller.
Lecture 6	Basic Introduction of Sensors and Actuators.
Lecture 7	Analog/Digital Conversion.
Module 3	Hardware and Software
Lecture 1	Hardware and Software.
Lecture 2	Integrated Circuits.
Lecture 3	Microcontroller Properties of 8051 and ARM.
Lecture 4	Microcontroller Components.
Lecture 5	Compilation and Interpretation.
Lecture 6	Python vs. C/C++.
Lecture 7	Operating Systems.
Module 4	Networking and the Internet
Lecture 1	Why is Networking Needed?
Lecture 2	WAN Structure.
Lecture 3	Networking Components.
Lecture 4	Internet Structure.
Lecture 5	Bluetooth Module.
Lecture 6	TCP/IP Application Layer.

Lecture 7	Wifi.
Module 5	Practical Sessions On Arduino
Lab1 & Theory	Arduino PIR Sensor Tutorial PIR Motion Sensor with Arduino.
Lab2 & Theory	Arduino Real Time Clock Tutorial using DS1307.
Lab3 & Theory	DIY RGB LED Matrix.
Lab4 & Theory	Arduino 7 Segment Display Interface.
Lab5 & Theory	Arduino 8x8 LED Matrix
Lab6 & Theory	Arduino DC Motor Control using L298N Motor Driver
Lab7 & Theory	Control speed of servo motor & stepper motor using Arduino board.
Lab8 & Theory	Interface GPS module with Arduino board and push data on cloud.
Lab9 & Theory	How Arduino MATLAB Interface Works?
Module 6	Practical Sessions On Node-MCU
Lab1 & Theory	Analog Read Serial Reads an analog input on pin 0, prints the result to the serial monitor. Graphical representation is available using serial plotter .
Lab2 & Theory	Digital Read Serial Reads a digital input on pin 2, prints the result to the serial monitor.
Lab3 & Theory	Interface Bluetooth module with Node-MCU board.
Lab4 & Theory	Control speed of servo motor & stepper motor using Node-MCU board.
Lab5 & Theory	Interface GPS module with Node-MCU board and push data on cloud.
Lab6 & Theory	Control speed of dc motor using PWM .
Module 7	Practical Sessions On FRDM Board
Lab1 & Theory	Programming Using Pulse width Modulation & Delays.
Lab2 & Theory	Interfacing of ADC and reading the value of analog sensors
Lab3 & Theory	Serial Port Programming & Serial communication with CPU.

Lab4 & Theory	Interfacing of ADC & Serial port of ARM Controller.
Lab5 & Theory	Introduction to Accelerometer & Surface Level Indication Using Accelerometer
Lab6 & Theory	Data Acquisition System using Serial PC Interface.
Lab7 & Theory	Introduction to touch sensor, its interfacing & programming.
Lab8 & Theory	Gesture controlled USB Mouse using Accelerometer.
Module 8.A	Sensors & Actuors Interfacing
Lecture 1	Selection criteria for sensors, Actuators
Lecture 2	Electrical Actuators :Solenoids, Relays, Diodes, Thyristors, Triacs, BJT, FET, DC motor,
Lecture 3	Electrical Actuators :Servo motor, BLDC motor, AC motor, Stepper motors
Lecture 4	Hydraulic and Pneumatic actuators
Lecture 5	Actuators, Position, Displacement and Proximity Sensors
Lecture 6	Force and torque sensors, Pressure sensors, Flow sensors
Lecture 7	Temperature sensors, Acceleration sensors, Level sensors
Module 8.B	Practical Session
Lab1 & Theory	Temperature Sensor.
Lab2 & Theory	Humidity Sensor.
Lab3 & Theory	Pressure Sensor.
Lab4 & Theory	PI Sensor.

Lab5 & Theory	Accelerometer.
Lab6 & Theory	Vibration Sensor.
Lab7 & Theory	Ultra Sonic Sensor.
Lab8 & Theory	Turbidity Sensor.
Module 9	
Practical Sessions On Raspberry Pi	
Lab1 & Theory	Introduction of Python as Scripting language Python installation IDE Installation.
Lab2 & Theory	Understanding Python Data Type so List: Tuple, Dictionary, Sequence.
Lab3 & Theory	Understanding Logical and Arithmetic Operators.
Lab4 ,5& Theory	Using conditional Statement in Python :If-Else loop, for loop, While Loop, pass break continue,One line Conditional statement.
Lab6,7 & Theory	GPIO handling With Python:Digital Outputs Blinking LED, Interfacing buttons with Raspberry Pi, Interfacing Buzzer and Tone generation, Interfacing OLED Display with Raspberry Pi.
Project	
<ul style="list-style-type: none"> • Smart Agriculture System • Home Automation • Line Follower • Air Quality Monitoring System • Garbage Door monitoring System • Health Care System 	