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Transforming Dreams! Redefining Future!

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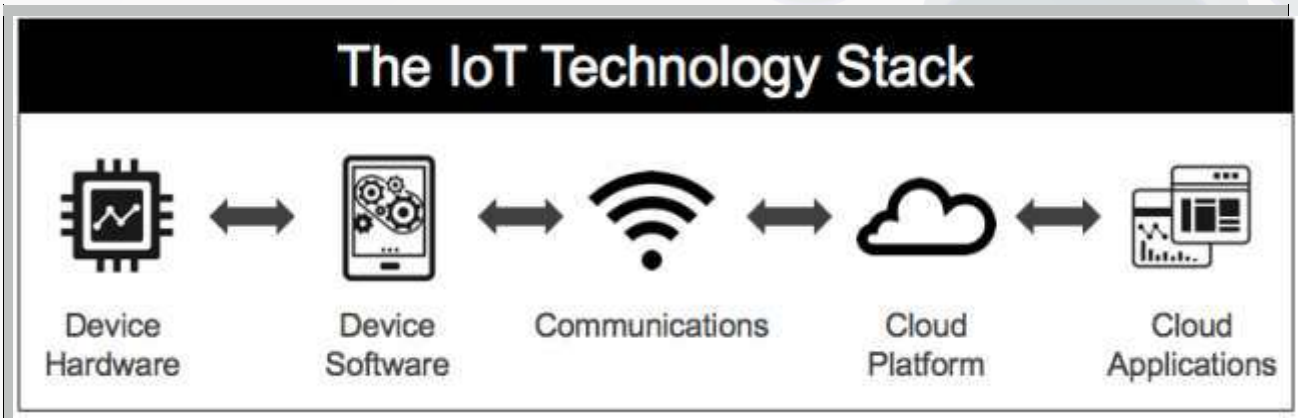
INTERNET OF THINGS



DeviceName	Programming Language	Connection Type	Cloud& Storage	Applications
ArduinoUno& Mega	C / C++	BLUE TOOTH	AWS (Amazon Web Services)	BlockChain
Nodemcu	C/ C++	WIFI	GCP (Google Cloud Platform)	Artificial Intelligence
ESP8266	C/ C++	GSM	MicroSoft Azure	SAP
ESP32	C/ C++	RF(Radio Frequency)	Digital Ocean	BIG Data / Hadoop
RaspberryPi	Python	LORA	BLYNK (Mobile APP)	Web Applications
OrangePi	Python	SATCOM	CAYENNE(Web and Mobile)	Mobile Applications
Dragon	Python	NODE-RED	ThinkWorx	Machine Learning
PiBoard	Python	LIFI	Carrot	OpenCV Computer Vision

IOT – OVERVIEW

- IoT KeyFeatures
- IoT – Advantages
- IoT – Disadvantages & How to overcome them during the design
- IoT Implementations
- Realtime Scenarios
- Demo of realtime project with Heart Sensor .

IOT – HARDWARE week 1

- Sensors
- Types of Sensors
  - ▶ Analog Sensors with examples
  - ▶ Digital Sensors with examples
- Actuators with examples

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IoT

MicroProcessors(µP) & MicroControllers(µC)

- Key Features & Differences .
- How to Choose between processor & a controllers
- Arduino Uno & Pinout
- Arduino Nano & Pinout
- Arduino Mega & Pinout
- ESP8266 & Pinout
- NodeMCU & Pinout
- ATTiny & Pinout
- Raspberry pi & Pinout
- Orange Pi & Pinout

Connectors

- Wires / Bus wires .
- PCBs general purpose pcbs
- Custom PCBs using ECAD tools.

IOT – SOFTWARE week 2

- IDE (Integrated Development Environment)
- Introduction to IDEs
- arduino.cc
- and download software
- Features .
- Baudrate
- Serial Monitor
- Serial Plotter
- Update Boards
- Update Libraries
- Debug
- Introduction with Arduino Boards.
- Working with Board Managers
- GPIO .
- Interfacing sensors with Arduino boards

IOT PROGRAMMING week 3

- Programming IOT devices using C , C++ , Python , Lua Scripting
- Basics of C , C++ , Python, Lua Scripting
- Input-Output
- Reading from the Serial
- Writing to Serial
- OOPS Concepts
- If loops
- If else loop
- While loop
- for loop
- Introduction to Functions
- Using OEM libraries .

IOT GATEWAYS - week 4

- Introduction to IOT Gateways
- Different types of gateways
- Advantages and Disadvantages of each of the gateways
- Choose the right Gateway according to your Requirement

IOT COMMUNICATION Layers week 5

- Machine to Machine Communication (m2m)
- Advantages & Disadvantages
- Types
- Bluetooth
- Wifi
- Radio Frequency (RF Channel)
- Zigbee
- LoRAWAN
- NFRC (Near Field Radio Frequency)

Machine to Cloud Transportation

- Purpose of Cloud
- Advantages & Disadvantages
- Cloud Examples
- AWS - S3 / Lambda
- ThinkSpeak
- Spark fun
- Blynk Mobile App

√Build your own Cloud and connect Blynk App week 6

- Advantages
- Privacy
- Better Security
- More Options

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IoT

IOT PROTOCOLS week 7

- HTTPs/REST - IPV4 IPV6
  - Advanced Networking
  - Webserver
  - Rest Client
- AMQP - Azure IoT SDK
  - Usage of AMQP for Microsoft Azure cloud
  - Advantages and Disadvantages
  - Best Practices and Usages of AMQP
- MQTT - Mosquito MQTT
  - Usage of MQTT for transporting Data to Cloud
  - Advantages and Disadvantages
  - Best Practices and Usages of MQTT
- CoAP
  - Usage of CoAP protocol
  - Advantages & Disadvantages
- Best Practices and usage

IOT – SECURITY week 8

- Authentication
  - Overview of Authentication
  - Why it is needed
  - Different ways of authentication
  - Testing them with Bruteforce tools
  - Examples
- Implementation on IOT devices

- Remote Debug
  - Remote Connectivity of IOT Device
  - Direct Connection
  - Remote Connection
  - Retrieving debug logs for error codes
  - Include in Remote Code in IOT Devices
- Encryption
  - Types of Encryption
  - Simple and Best Usage
  - Examples
- Privacy
  - overview of privacy
  - how it is being implemented
  - Publishing Data over Cloud
  - Examples
- Authorization
  - Overview
  - How is it is implemented in IOT and Cloud
  - Implementations examples
- Remote Firmware Upgrade
  - Why is Firmware Upgrade is needed
  - Over The Air Upgrade
  - Manual and Automatic Upgrade
  - Examples .

REAL TIME PROJECT: Week 9

- Requirement Documents
- Design
- Detailed Design
- Development
- Testing of IOT Devices .
- Test Cases
- Build & Deployment
- Monitoring
- Trouble Shooting

IOT – USE CASES Week 10

- IoT Course Content
- QUALITY THOUGHT
- Engineering,
- Industry, and
- Infrastructure
- Government and Safety
- Home and Office
- Health and Medicine

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