In partnership with

Internet of Things (IoT)

Externship Program Course Content

Approved by AICTE

SmartInternz

In partnership with

Start Date: **28 June 2021**

Timings: **5:30 – 7:30 PM**

Duration: **30 Days (3 Weeks Live Sessions + 1 Week Project Development)**

Program Benefits:

- ✓ **40 Hrs. Live Instructor-Led Training**
- ✓ **40 Hrs. Project Development**
- ✓ **Dedicated Mentor Support**
- ✓ **1 Guided Project**
- ✓ **Project Completion Certificate from IBM**
- ✓ **Externship Completion Certificate from SmartInternz**

Course Content

Modules	Content
Module 1	**Introduction to Internet of Things (IoT)** • IoT Architecture & Deployment models • Building Blocks of IoT • Applications of IoT • IoT Software & Hardware Frameworks • Technical Architecture of few IoT Applications
Module 2	**Introduction to open Hardware platforms and Tinkercad Circuits** • Introduction to Arduino Uno board • Introduction to Tinkercad Circuits - online simulation platform • Programming Digital I/O's with Tinkercad Circuits • Programming Analog I/O's with Tinkercad Circuits

Modules	Content
Module 3	**Integration of Sensors & Actuators** • Working with PIR Sensor • Working with Servo Motor • Working with Ultrasonic Sensor
Module 4	**Introduction to Python** • Python Environment setup **Python basics** • Python-Variable Types • Python- Basic Operators • Python- Strings • Python- Lists
Module 5	**Python - Tuple, Functions** • Tuples • Dictionary • Date & Time • Functions
Module 6	**Modules** **Files I/O** Python In-Built libraries **Overview of OOP Terminology** **Creating Classes**
Module 7	**Python Network Programming – TCP/IP & Socket Programming** **Basics of Networking** • IP Address • Ports & Sockets • Direct + Reverse Connection • Create a server **Network Programming with Python** • Creating a Socket • Binding the Socket and Listening for Connections • Sending Commands to the Client • Client to Server Connection • Testing the Program Locally

Modules	Content
Module 8	**IoT Communication Technologies** • Introduction to short range communication technologies • Introduction to long-range communication technologies **IoT Communication Protocols** • Device Network Connectivity • Client-Server Communication Model • Publish-Subscribe Communication Model • Working with HTTP and MQTT protocols • Hands on Practical's of HTTP & MQTT protocol
Module 9	**Introduction to Raspberry pi and IOTIFY Platform** • Introduction to Raspberry pi • Introduction to IOTIFY platform • Programming Sensors using IOTIFY Simulators
Module 10	**Introduction to IoT Platforms & Architecture** • Device Management • Device Authentication • SDK's & API Integrations • Getting Started with IBM Watson IOT Platform • Connect online simulator platform to Watson IOT Platform • Explore python client libraries for sending data to Watson IoT Platform using MQTT • Visualizing real-time data by using boards and cards
Module 11	**Web & Mobile App development** • Introduction to Node-RED Service • Build a Web App to display sensor data and sending commands through buttons • Configure API's to communicate with Mobile App • Introduction to MIT App inventor for mobile Application development.

Modules	Content
	• Build a Mobile App to display the sensor data and send commands to IoT device
Module 12	**Introduction to Database Services of IBM Cloud** • Introduction to Cloudant NoSQL DB • Query and Process Watson IoT Device Data from Cloudant NoSQL DB • API & Client Libraries for Cloudant NoSQL DB • Introduction to Cloud Object storage • Create buckets for storing files • Explore python client libraries for bucket operations
Module 13	**Introduction to Computer Vision with Python** • What is Computer Vision • Applications of Computer Vision • Introduction to OpenCV, Python Packages • Working with image and video files
Module 14	**Introduction to IBM Watson AI & Building Intelligent Devices** • IBM Watson Visual Recognition API • Speech to Text API • Text to Speech API • IBM Watson Assistant Conversational Devices
Module 15	**Python Web Applications - Flask Basics** • Python Web Frameworks • Flask Templates • Flask Forms • Flask and Databases
	Building Usecases