

Internet of things Applications**Class: BSC-III****DURATION: One Year****Dr. G. S. Nhivekar****Department of Electronics**

1. Title: Internet of things Applications
2. Year of implementation: 2020

Structure of Value Added Course

Duration	Theory Periods	Practical Periods	Total Periods	Credits	No. of Students in batch
1 Year	10	30	40	2	20

Syllabus**Learning Objectives:**

1. To learn conceptual knowledge of architecture, operation, and benefits of an IoT solution.
2. To design and development IOT system for various applications.

Unit I: Introduction to IoT**(5)**

Basics of internet of things (IoT): Introduction to Internet of Things, Physical Design of IOT, Logical Design of IOT, IOT Levels. IOT Enabling Technologies: Wireless sensor networks, Cloud Computing, Big data Analytics, Communication Protocols. Domain Specific IOTs: Home Automation, Cities, Environment, Energy, Retail, Logistics, Agriculture, Industry, Health & Life Style.

Unit II: Developing IoTs:**(5)**

Installing Python, Python Data Types & Data Structures, Control Flow, Functions, Modules, Packages, File Handling, Python Packages.

IOT Physical Devices: What is an IOT Device, Exemplary Device, Raspberry Pi, Arduino, Node MCU, Interfaces, and Programming & IOT Devices.

Learning Outcomes:

At the end of this course, the students should be able to

1. Explain architecture, operation, and benefits of an IoT solution.
2. Build and test a complete, working IOT system involving prototyping, programming.

Reference books:

1. Vijay Madiseti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach" Orient Black swan Private Limited - New Delhi; First edition (2015)
2. Fundamentals of Wireless Sensor Networks: Theory and Practice , Walteneus Dargie, Christian Poellabauer, Wiley-Blackwell; 1 edition (23 July 2010)
3. Adrian McEwen, "Designing the Internet of Things", Wiley Publishers, 2013
4. Yashavant Kanetkar & Aditya Kanetkar, "Let Us Python" 2nd Edition, BPB Publications (8 July 2019).

Practical Syllabus**Objectives:**

1. To understand the definition and significance of the Internet of Things.
2. To learn conceptual knowledge of architecture, operation, and benefits of an IoT solution.
3. To design and development IOT system for various applications.

List of Experiments:

(30) hr

1. Interfacing with digital and Analog sensors-Analog light intensity sensors
2. Interfacing of Ultrasound transceiver, IR range sensor of different range
3. Interfacing with Bluetooth module with IoT Platform.
4. To develop IOT weather monitoring system
5. Make security system using RFID

6. Display scrolling message on LED matrix using Arduino
7. Interfacing of GSM / GPS module to Arduino.
8. Interface Wi-Fi module with IoT Platform to toggle LEDs and control relays
9. To develop IOT system for Smart Homes
10. Interfacing Camera module to IOT platform

Learning Outcomes:

After completion of the practical, Student are able to:

1. Explain architecture, operation, and benefits of an IoT solution.
2. Design circuits for various applications using sensor and microcontroller
3. Build and test a complete, working IOT system involving prototyping, programming.

Reference books:

1. Vijay Madiseti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach" Orient Black swan Private Limited - New Delhi; First edition (2015)
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BOS Sub Committee:

1. Mr. S. R. Pol
2. Mr. S. K. Shinde
3. Dr. G.S. Nhivekar

Expert Committee:

1. Mr D.M. Panalkar
Asst. Prof Vivekanad College, (Autonomous), Kolhapur
2. Mr. Milind Patil
Nubulus Enterprises, Shirol MIDC, Kolhapur