

PIT5J002 INTERNET OF THINGS

Module 1

Introduction: Definition – Foundations – Challenges and Issues - Identification - Security.
Components in internet of things: Control Units – Sensors – Communication modules –Power Sources – Communication Technologies – RFID – Bluetooth – Zigbee – Wifi – Rflinks –Mobile Internet – Wired Communication-IoT Platform Overview-Raspberry pi-Arduino boards.

Module2

IoT Protocols: Protocol Standardization for IoT-M2M and WSN Protocols-SCADA and RFID Protocols-Issues with Iot Standardization-Protocols-IEEE 802.15.4-BACNet Protocol-Zigbee,Architecture - Network layer – APS Layer – Security.

Module 3

Resource Management in the Internet of Things: Clustering - Software Agents – Data Synchronization - Clustering Principles in an Internet of Things Architecture - The Role of Context - Design Guidelines -Software Agents for Object – Data Synchronization- Types of Network Architectures - Fundamental Concepts of Agility and Autonomy-Enabling Autonomy and Agility by the Internet of Things - The Evolution from the RFID-based EPC Network to an Agent based Internet of Things- Agents for the Behaviour of Objects.

Module 4

Case Study and IoT Application Development: IoT applications in home- infrastructuressecurity- Industries- IoT electronic equipments. Use of Big Data and Visualization in IoT Industry 4.0 concepts - Sensors and sensor Node –Interfacing using Raspberry Pi/Arduino- Web Enabled Constrained Devices.

Module 5

Web of Things: Web of Things versus Internet of Things-Architecture Standardization for WoT- Platform Middleware for WoT- WoT Portals and Business Intelligence-Cloud of Things:Grid/SOA and Cloud Computing-Cloud Standards –Cloud of Things Architecture-Open Source e-Health sensor platform.

Programming assignments are mandatory.Develop schemes for the applications of IOT in real time scenarios.Design business Intelligence and Information Security for WoT.

Text Books:

1. Honbo Zhou, "The Internet of Things in the Cloud:A Middleware Perspective" -- CRC Press-2012.
2. Dieter Uckelmann, Mark Harrison, "Architecting the Internet of Things", Springer-2011.
3. Arshdeep Bahga, Vijay Madisetti, "Internet of Things (A Hands-On-Approach)", VPT, 2014.
4. Olivier Hersent, David Boswarthick, Omar Elloumi, "The Internet of Things – Key applications and Protocols", Wiley, 2012.

References:

1. Luigi Atzori, Antonio Lera, Giacomo Morabito, "The Internet of Things: A Survey",
2. Journal on Networks, Elsevier Publications, October, 2010.
3. <http://www.theinternetofthings.eu/what-is-the-internet-of-things>.