

Internet of Things(IoT)

Course Content:

- 1. Introduction:** Concept, Importance, Interdisciplinary, Challenges, Various applications/smart objects, Major Players/Industry, Standards
- 2. IoT Architecture:**
 - a. Node Structure:** Sensing, Processing, Communication, Powering
 - b. Networking:** Topologies, Layer/Stack architecture
- 3. Communication Technologies:** Introduction to ZigBee, BLE, WiFi, LTE, IEEE 802.11ah, Discuss data rate, range, power, computations/bandwidth, QoS
- 4. Smartness - Signal Processing/Analytics:** Impact on Power/Energy savings, dynamic networks, simple case studies
- 5. IoT Fabricator:** Introduction to Embedded electronics, fabricating electronics, Communication Network requirements, Data processing challenges – recreation, IP/security, Challenges
- 6. Hands-on in IoT:** Projects based on some Hardware (Raspberry pi, Arduino, Intel, IITH Mote, Smartphones), Software (Contiki, TinyOS, Android), IoT Fabricator

Reference Books:

1. Interconnecting Smart Objects with IP: The Next Internet, Jean-Philippe Vasseur, Adam Dunkels, Morgan Kuffmann
2. Designing the Internet of Things , Adrian McEwen (Author), Hakim Cassimally
3. Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems, Dr. Ovidiu Vermesan, Dr. Peter Friess, River Publishers
4. Internet of Things (A Hands-on-Approach) , Vijay Madiseti , Arshdeep Bahga
5. 6LoWPAN: The Wireless Embedded Internet, Zach Shelby, Carsten Bormann, Wiley
6. Building the internet of things with ipv6 and mipv6, The Evolving World of M2M Communications, Daniel Minoli John Wiley & Sons
7. Recent research/white papers