A REPORT ON
INTERNET OF THINGS & ITS APPLICATIONS
During 19th to 24th February, 2018

A one week workshop is organized by Electronics and Communication Engineering on "INTERNET OF THINGS & ITS APPLICATIONS" during 19th to 24th Feb 2018 in association with Smart Bridge for the benefit of students to understand the new technologies and softwares beyond the curriculum.

The **Internet of Things (IoT)**, also called Internet of Everything or Network of Everything, is the network of physical objects or "things" embedded with electronics, software, sensors, and connectivity to enable objects to exchange data with the production, operator and/or other connected devices based on the infrastructure of International Telecommunication Union's Global Standards Initiative.

The Internet of Things allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between the physical world and computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure

The following topics are covered during the workshop:

TOPICS:

Day-1: Understand IoT, Architecture, Implementation
1. Introduction to Internet of Things (IoT)
2. Applications of IoT in various business sectors
3. IoT Architecture
4. Building Blocks of IoT
5. Sensors & Embedded Systems for SmartThings
6. IoT Gateways & Edge Nodes
7. Communication Technologies & Protocols
8. Cloud Computing & IoT Platforms
9. Mobile & Web Applications
10. Steps for Building IoT Prototypes
11. Latest Innovations & Use Cases

Day-2: Arduino Board, Sensors, Integration
1. Introduction to Arduino Development Boards
2. Sensors & Interfacing with Arduino UNO
3. Arduino IDE and Programming Concepts
4. Importing External Packages (Libraries and Boards)

Practicals
a. Illumination measurement using LDR
b. Outdoor Temperature & Humidity Monitoring
c. Motion Detection using PIR sensor
d. Distance Measurement using Ultrasonic Sensor
e. Controlling High power circuits using Relays
f. Position control using servo motor

Day-3: NodeMCU , Network & Cloud Integration, Communication Protocols
1. Introduction to IoT Cloud Platform and RESTful Webservices
2. Working on NodeMCU development modules
3. Arduino core for NodeMCU development Board
4. NodeMCU as an Access point and a Station
5. Generating API requests to the cloud from NodeMCU
6. Data Visualization, Data Analytics, Rules Management, Cloud enabled control
Practicals
a. Uploading Temperature & Humidity data to ThingSpeak Cloud
b. Remote control of appliance from remote location through cloud
c. SmartHome – Android App development
d. Automatic Phone/Email Notification based on Event trigger using IFTTT
e. SmartHome Automation with NodeMCU in Access point mode
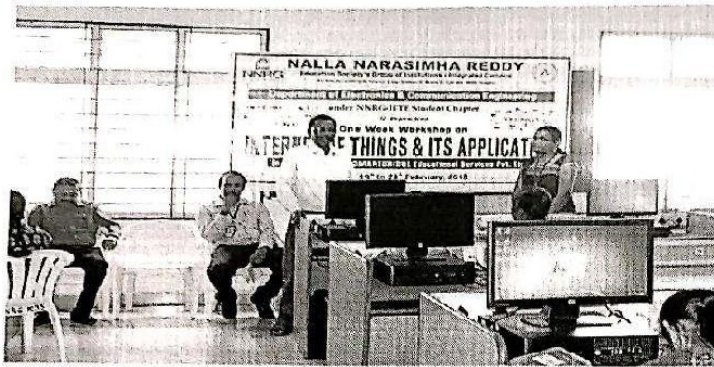
Day-4: Application Development
1. Role of Applications for Internet of Things
2. Rapid Application development platforms
3. Introduction to MIT App Inventor for Android App development
4. Working on building GUI and Blocks
5. Working with Mobile sensors –Accelerometer, Location Sensor and Orientation sensor.
6. Working with Mobile Communication – Bluetooth, Wi-Fi and NFC
7. Introduction to web Applications
8. Building web applications to interact with cloud
9. Implementing AJAX in web pages

Day-5: IoT Prototyping
Working on following use cases
a. Smart Parking
b. Smart Illumination
c. Smart Water Management
d. Smart Health care
e. Smart Agriculture
f. Smart Energy Management
g. Smart Home

The key issues of the workshop were summarized and the workshop was closed on 24th February 2018 with concluding remarks from the ECE-HOD Dr.M.A.Khadar Baba, Professor Dr.P.Subbaiah, Professor Dr.B.C.PremKumar, Mr. P.S Sreenivasa Reddy, Associate Professor and Workshop convener Ms.G.Indira Priyadarshini Associate Professor ECE Department followed by certificate distribution to the participants.