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INTERNET OF THINGS TECHNOLOGY
[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2016 -2017)
SEMESTER – VIII

Subject Code	15CS81	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03
CREDITS – 04			

HKBK COLLEGE OF ENGINEERING, BENGALURU

Syllabus- Internet Of Things Technology

Course Objectives: This course will enable students to

- Assess the genesis and impact of IoT applications, architectures in real world.
- Illustrate diverse methods of deploying smart objects and connect them to network.
- Compare different Application protocols for IoT.
- Infer the role of Data Analytics and Security in IoT.
- Identify sensor technologies for sensing real world entities and understand the role of IoT in various domains of Industry.

Course Outcomes: After studying this course, students will be able to

- Interpret the impact and challenges posed by IoT networks leading to new architectural models.
- Compare and contrast the deployment of smart objects and the technologies to connect them to network.
- Appraise the role of IoT protocols for efficient network communication.
- Elaborate the need for Data Analytics and Security in IoT.
- Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

Syllabus- Internet Of Things Technology

Module – 1	Teaching Hours
What is IoT, Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT and IoT, IoT Challenges, IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures, A Simplified IoT Architecture, The Core IoT Functional Stack, IoT Data Management and Compute Stack.	10 Hours
Module – 2	
Smart Objects: The "Things" in IoT, Sensors, Actuators, and Smart Objects. Sensor Networks, Connecting Smart Objects, Communications Criteria, IoT Access Technologies.	10 Hours
Module – 3	
IP as the IoT Network Layer, The Business Case for IP, The need for Optimization, Optimizing IP for IoT, Profiles and Compliances, Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods.	10 Hours

Syllabus- Internet Of Things Technology

Module – 4	
Data and Analytics for IoT, An Introduction to Data Analytics for IoT, Machine Learning, Big Data Analytics Tools and Technology, Edge Streaming Analytics, Network Analytics, Securing IoT, A Brief History of OT Security, Common Challenges in OT Security, How IT and OT Security Practices and Systems Vary, Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment	10 Hours
Module – 5	
IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing the Software, Fundamentals of Arduino Programming, IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi, About the RaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming RaspberryPi with Python, Wireless Temperature Monitoring System Using Pi, DS18B20 Temperature Sensor, Connecting Raspberry Pi via SSH, Accessing Temperature from DS18B20 sensors, Remote access to RaspberryPi, Smart and Connected Cities, An IoT Strategy for Smarter Cities, Smart City IoT Architecture, Smart City Security Architecture, Smart City Use-Case Examples.	10 Hours

Module – 3 IP as the IoT Network Layer

IP as the IoT Network Layer:

➢ **The Business Case for IP**: This section discusses the advantages of IP from an IoT perspective and introduces the concepts of adoption and adaptation.

➢ **The Need for Optimization**: This section dives into the challenges of constrained nodes and devices when deploying IP. This section also looks at the migration from IPv4 to IPv6 and how it affects IoT networks.

➢ **Optimizing IP for IoT**: This section explores the common protocols and technologies in IoT networks utilizing IP, including 6LoWPAN, 6TiSCH, and RPL.

➢ **Profiles and Compliances**: This section provides a summary of some of the most significant organizations and standards bodies involved with IP connectivity and IoT.
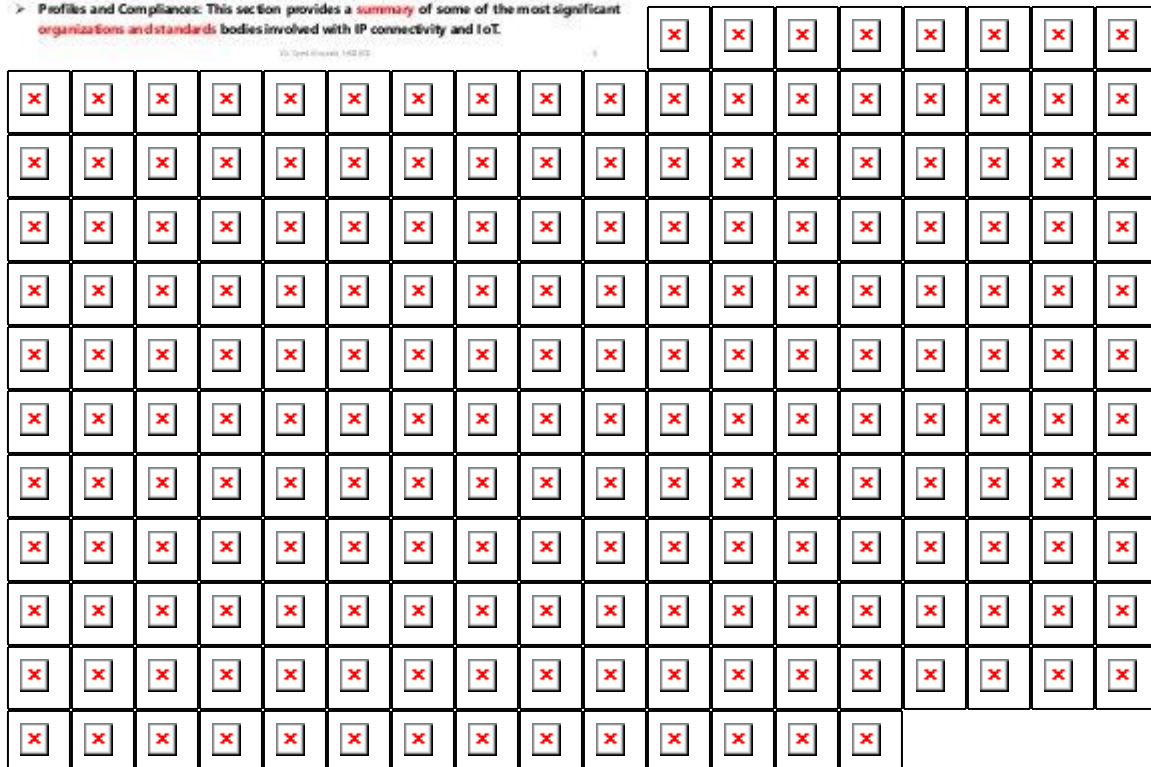
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Syllabus- Internet Of Things Technology

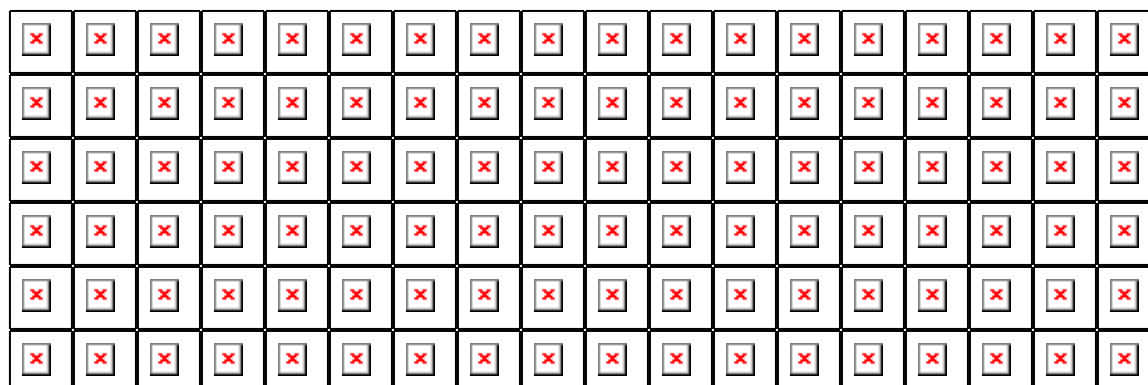**Course Objectives:** This course will enable students to

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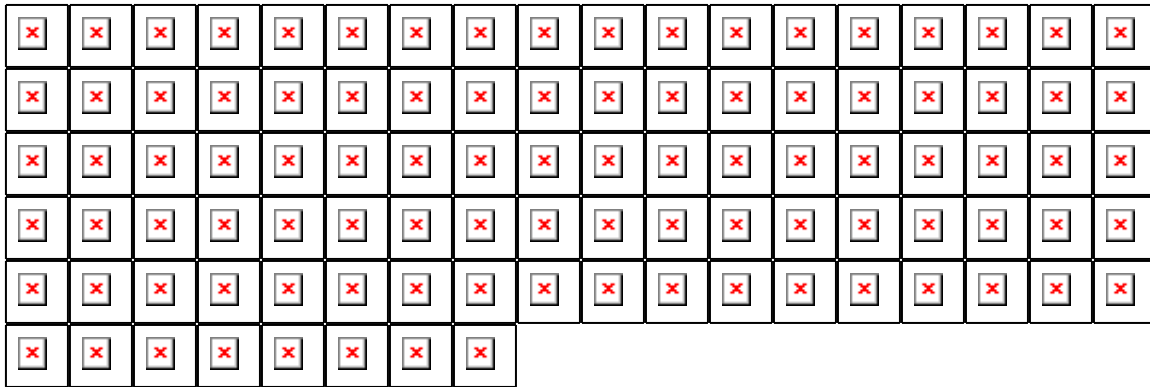
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15CS81- IoT- VTU- module 3

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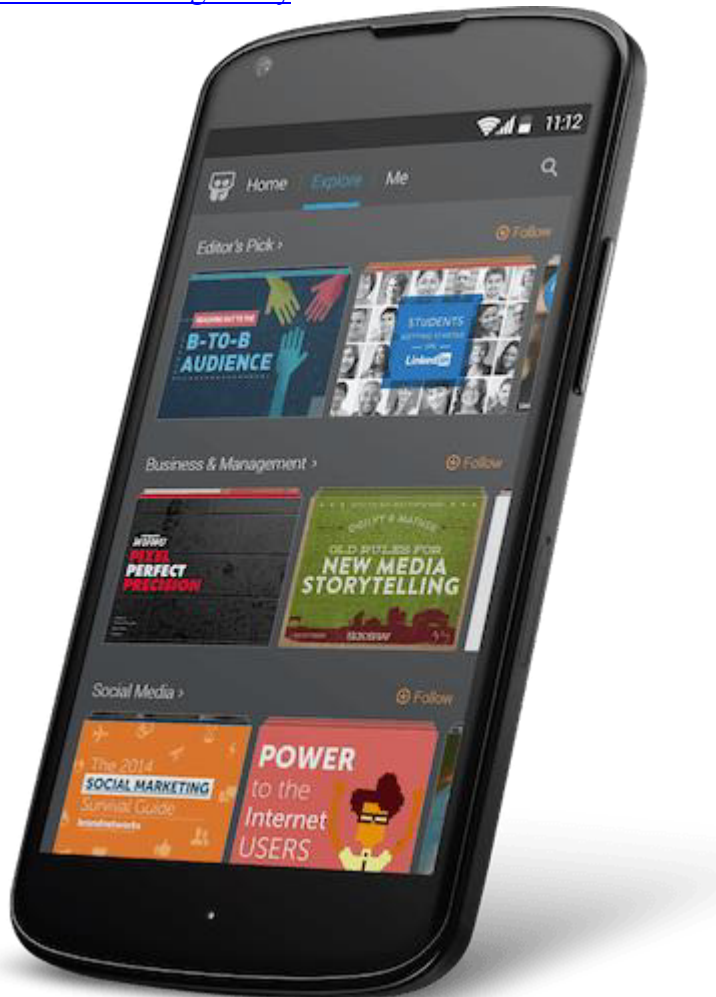
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