21CYS10	WIRELESS ADHOC AND SENSOR NETWORKS	L	T	P	C
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Course Objectives

- To understand the fundamentals of Internet of Things
- To be familiar with the components required for enabling communication in IoT
- To understand the different types of communication technologies and protocols
- To be familiar with IoT integration with Cloud.

UNIT I	INTRODUCTION	9 Hours

IoT Terms and Basic Definitions – Characteristics - Enabling Technologies in IoT - Sensors – Edge Devices – Embedded Systems – Communications Model - M2M - Wireless Sensor Networks - Cloud Computing - Applications and Vision of IoT.

UNIT II	ARCHITECTURE REFERENCE MODEL	9 Hours

Physical Devices and Controllers – Connectivity: Communication Model, Protocols, Communication APIs for IoT – Edge Computing - Data Accumulation - Data Abstraction – Application – Collaboration and Processes.

UNIT III	TRANSDUCERS, SENSORS AND ACTUATORS	9 Hours

Defining Transducers, Sensors and Actuators-Workflow – Classification of Transducers, Sensors and Actuators –Interfacing with Embedded Systems-WSN and its Technologies.

UNIT IV	LAYER 1/2/3 CONNECTIVITY TECHNOLOGIES	9 Hours

RFID – NFC-Bluetooth – ZigBee –Lora - Wi-Fi –WiMAX- LTE – IPv4 Vs IPv6 Addressing – IPv6 Protocol –Quality of Service in IPv6- Header Compression Schemes – 6LoWPAN.

UNIT V	COMMUNICATION PROTOCOLS	9 Hours

Classification – Message Queue Telemetry Transport(MQTT) -Architecture – XMPP – Architecture – Advantages – Case studies – DDS-AMQP-Model-Architecture-Protocol-CoAP – Features- Architecture – Applications – REST – Architecture-Case Studies

UNIT VI	RECENT TRENDS	

Recent Trends in Wireless Adhoc And Sensor Networks

TOTAL PERIODS: 45

Course Outcomes:

At the end of the course, Students can able to

- Understand and explain the fundamentals of Internet of Things
- Explain the Protocol Stack for IoT
- Compare and contrast various communication technologies
- Understand and explain different communication protocols'
- Comprehend integration of IoT in Cloud

Text books:

1. Srinivasa K G, Siddesh G.M, Hanumantha Raju R, Internet of Things, CENGAGE, 1st Edition, 2017.
2. Daniel Minoli, Building the Internet of Things with IPv6 and MIPv6, 1st Edition, John Wiley & Sons, 2013.
3. Shriram K Vasudevan, Abhishek S Nagarajan, RMD Sundaram, Internet of Things, 1st Edition, Wiley Publications, 2019.

Reference Books:

1. Sherali Zeadally, Nafaa Jabeur, Cyber Physical System Design with Sensor Networking Technologies, 1st Edition, The Institution of Engineering and Technology, London, UK, 2016.
2. K.Daniel Wong, Fundamentals of Wireless Communication Engineering Technologies, 1st Edition, John Wiley & Sons, 2012.
3. Arshdeep Bahga, Vijay Madisetti, Internet of Things: A Hands-on Approach, First Edition, Universities Press, 2015.
4. Adrian McEwen & Hakim Cassimally, Designing the Internet of Things, Wiley, 2013.
5. Samuel Greengard, The Internet of Things, MIT Press Essential Knowledge series, 2015.
6. Olivier Hersent, David Boswarthick, Omar Elloumi, The Internet of Things: Key Applications and Protocols, Wiley, 2012