402- IoT (Internet of Things)

Course Code	**402**
Course Title	IoT (Internet of Things)
Credit	3
Teaching per Week	3 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation etc.)
Review / Revision	June 2021
Medium of Instruction	English
Purpose of Course	The purpose of this course is to provide basic understanding of IoT.
Course Objective	To understand the concepts and protocols related to Internet of Things. To get an idea where the application areas are available for the Internet of Things to be applied.
Pre-requisite	Basic Knowledge of Networking
Course Out come	On completion of this course, students will be able to: - Understand about IoT Technologies behind intelligent and smart devices - Learn about basics of IoT Hardware/Devices
Course Content	**Unit 1: Introduction to Internet of Things** 1.1 Definition & Characteristics of IoT 1.2 Introduction to IoT Architecture 1.3 Physical Design of IoT 1.3.1Things in IoT 1.3.2IoT Protocols (Ethernet , WIFI , WIMAX, LR-WPAN(Wireless personal area network), 2G/3G/4G Mobile Communication, IPV6,6LOWPAN,MQTT, WEB SOCKET) 1.4 Logical Design of IoT 1.4.1IoT Functional Blocks 1.4.2IoT Communicational Models - Request – Response - Publish –Subscribe - Push –Pull - Exclusive Pair **Unit 2. IoT and M2M** 2.1 Introduction M2M 2.2 Introduction to Sensor Technology 2.3 Difference between IoT and M2M, 2.4 Security for IoT 2.5 IoT Enabling Technologies 2.5.1 Wireless Sensor Networks 2.5.2 Big Data Analytics, 2.5.3 Embedded Systems. **Unit 3.Sensors and Actuators in IoT** 3.1 Definition of Sensors 3.2 Types of sensors and its usage (Temperature, Humidity, Gas Detector, Ultrasonic, Fire detector, Light, Sound, IR, Water Level) 3.3 Introduction to Actuators 3.4 Types of Actuators 3.5 Difference between Sensors & Actuators

	Unit 4.Introduction to Raspberry pi and Arduiano 4.1 Introduction on IoT Devices 4.2 Basic Building blocks of an IoT Device 4.3 Introduction to Raspberry pi (Concepts, purpose, Application areas) 4.4 Components of Raspberry pi 4.5 Introduction to Arduiano (Concept, purpose and Application areas) 4.6 Difference between Raspberry pi and Arduiano **Unit 5. Case Study** 5.1 IoT for Smart city applications 5.2 IoT for Smart Home 5.3 IoT for Health & Lifestyle
Reference Books	1. Internet of Things , A Hands – On Approach, Arshdeep Bahga, Vijay Madisetti published by Arshdeep Bahga& Vijay Madisetti 2. Internet of Things architecture and Design Principles, Raj Kamal, McGrawhill Education private limited, 2017 3. Learning Internet of Things, Peter Waher, / Packt Publishing Limited, 2015 4. The Internet of Things, Hakima Chaouchi, Wiley,2017 5. Getting started with the Internet of Things: by CunoPfister, O"Reilly Media. 6. The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)
Teaching Methodology	Class Work, Discussion, Self-Study, Seminars and/or Assignments
Evaluation Method	30% Internal assessment. 70% External assessment.