CP452: INTERNET OF THINGS
CREDITS = 5 (L=3, T=0, P=2)

Course Objective:
To introduce IoT platforms and the various protocols used in the interconnection of the smart objects

Teaching and Assessment Scheme:

Teaching Scheme			Credits	Marks Distribution				Total Marks
				Theory		Practical		
L	T	P	C	ESE	CE	ESE	CE	
3	0	2	5	70	30	30	20	150

Course Contents:

Unit No.	Topics	Teaching Hours
1	**Introduction:** IoT Architecture and different layers: Physical, Computing, Communication, Management etc.	05
2	**Platform:** Open-source prototyping platforms; Arduino, Raspberry pi etc.	10
3	**Protocols for IoT:** NFC, RFID, Zig-bee, IEEE 802.15.4e, Thread, 6LoWPAN, Constrained Application Protocol (CoAP), Extensible Messaging Protocol (XMPP) , WebSocket , Advanced Message Queueing Protocol (AMQP) , Message Queue Telemetry Transport (MQTT), Web Real Time Communications (WebRTC), LORA, SIGFOX, Z Wave.	12
4	**Data Analysis:** Big Data and Semantic Technologies.	04
5	**Operating System Aspects:** Various aspects of the OS designed for the IoT environment, open source OS for IoT such as Contiki OS, TinyOS etc.	05

6	**Security and privacy aspect of IoT :**	
	Security architecture of IoT, Security threats, Security initiatives towards IoT.	04
7	**Applications:**	
	Home Networking, Automotive Networks, Industrial Networks, Interactive Toys, Remote Metering.	05
	TOTAL	**45**

List of References:

1. Olivier Hersent , David Boswarthick & Omar Elloumi ,"The Internet of Things: Key Applications and Protocols Paperback – 25 Aug 2015",WileyPress
2. ArshdeepBahga & Vijay Madisetti ,"Internet of Things: A Hands-on Approach (Paperback – 1 Jul 2015)", Universities Press
3. CunoPfister ,"Getting Started with the Internet of Things (Paperback – 17 May 2011)", O'Reilly
4. Hakin Cassimally Adrian Mcewen," Designing the Internet of Things (Paperback – 25 Jul 2015)"
5. Massimo Banzi ,"Getting Started with Arduino (Make: Projects)", O'Reilly Media

Course Outcomes (COs):

After learning the course the students should be able to:

1. Understand concepts of smart objects and IoT
2. Work with various IoT platforms
3. Understand the need and the requirements for IoT Protocols
4. Simulate a given smart wireless networked scenario
5. Apply the knowledge gained to build smart systems on top of IoT operating systems
6. Develop systems to solve real time problems using IoT