Internet of Things

Course Code	23EC4501C	Year	III	Semester	I
Course Category	PE-I	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	-
ContinuousInternal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		BL
CO1	**Summarize** the genesis and impact of IoT applications, architectures in real world.	L2
CO2	**Apply** diverse methods in deploying smart objects and connecting them to network.	L3
CO3	**Construct** applications using Arduino.	L3
CO4	S**elect** different protocols required for communication in the IoT system.	L3
CO5	**Analyze** and develop a solution for a given application using APIs.	L4

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)
Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2								2		2		2
CO2	3				3				3		3	3	
CO3	2								2		2		2
CO4	2				2	2			2			2	
CO5	3	2	2						2		2	2	2
Avg.,	2	2	2		3				2		2	2	2

Syllabus		
Unit No.	**Contents**	**Mapped CO**
1	Genesis of IoT, IoT and Digitization, IoT Impact-Connected roadways, Smart connected buildings, Convergence of IT and IoT, IoT Challenges, Comparing IoT Architectures - OneM2M IoT Architecture and IoTWF Architecture, A Simplified IoT Architecture	CO1,CO2
2	Smart Objects: The Things in IoT- Sensors, Actuators, and Smart Objects, Sensor Networks-Advantages and Disadvantages, Communications Criteria-Range, Frequency bands, Power consumption, Topology, IoT Access Technologies- IEEE 802.15.4, IEEE 1901.2a, IEEE 802.11ah (only Standardization and Alliances, Physical Layer, MAC Layer and Topology)	CO1,CO2
3	Embedded Computing Basics- Microcontrollers, System-on-Chips, Choosing Your Platform, Arduino- Developing on the Arduino, Some Notes on the Hardware, Openness	CO1,CO3

4	Communication in the IoT: Internet Principles, Internet Communications: An Overview- IP, TCP, The IP Protocol Suite (TCP/IP), UDP, IP Addresses- DNS, Static IP Address Assignment, Dynamic IP Address Assignment, IPv6, MAC Addresses, TCP and UDP Ports- An Example: HTTP Ports, Other Common Ports, Application Layer Protocols- HTTP, HTTPS: Encrypted HTTP, Other Application Layer Protocols.	CO1, CO4
5	Prototyping Online Components: Getting Started with an API, Writing a New API, Real-Time Reactions, Other Protocols.	CO1, CO5

Learning Resources
Text Books
1. Adrian McEwen, Hakim Cassimally - Designing the Internet of Thing Wiley Publications, 2012. 2. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry," IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things, 1st Ed., Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)
Reference Books
1. ArshdeepBahga, Vijay Madisetti - Internet of Things: A Hands-On Approach, Universities Press, 2014 2. Srinivasa K G, Internet of Things, CENGAGE Leaning India, 2017
e-Resources & other digital material
1. https://ocw.cs.pub.ro/courses/iot 2. https://education.ni.com/teach/resources/1079/industrial-internet-of-things-laboratory