

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	-
Continuous/Internal 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	Select 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	PO12	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	
<ol style="list-style-type: none"> 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	
<ol style="list-style-type: none"> 1. ArshdeepBahga, Vijay Madiseti - Internet of Things: A Hands-On Approach, Universities Press, 2014 2. Srinivasa K G, Internet of Things, CENGAGE Learning India, 2017 	
e-Resources & other digital material	
<ol style="list-style-type: none"> 1. https://ocw.cs.pub.ro/courses/iot 2. https://education.ni.com/teach/resources/1079/industrial-internet-of-things-laboratory 	