

## INTERNET OF THINGS

<b>Course Code</b>	20ES1501	<b>Year</b>	III	<b>Semester</b>	I
<b>Course Category</b>	ES	<b>Branch</b>	ECE	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Prerequisites</b>	-
<b>Continuous Internal Evaluation:</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

### Course Outcomes

Upon successful completion of the course, the student will be able to

<b>CO1</b>	<b>Summarize</b> the genesis and impact of IoT applications, architectures in real world.	L2
<b>CO2</b>	<b>Apply</b> diverse methods in deploying smart objects and connecting them to network.	L3
<b>CO3</b>	<b>Construct</b> applications using Arduino.	L3
<b>CO4</b>	<b>Select</b> different protocols required for communication in the IoT system.	L3
<b>CO5</b>	<b>Analyze</b> 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**

**\* - Average value indicates course correlation strength with mapped PO**

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
<b>CO1</b>	2									2		2		2
<b>CO2</b>	3		3		3					3		3	3	
<b>CO3</b>	2		2							2		2		2
<b>CO4</b>	2				2		2			2			2	
<b>CO5</b>		2	2							2		2	2	2
Average* (Rounded to nearest integer)	2	2	2		3					2		2	2	2

Syllabus		
Unit No.	Contents	Mapped CO
I	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
II	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
III	Embedded Computing Basics- Microcontrollers, System-on-Chips, Choosing Your Platform, Arduino- Developing on the Arduino, Some Notes on the Hardware, Openness	CO1, CO3
IV	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
V	Prototyping Online Components: Getting Started with an API, Writing a New API, Real-Time Reactions, Other Protocols.	CO1, CO5

Learning Resources
<b>Text Books</b>
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, 1stEdition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)
<b>Reference Books</b>
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
<b>e-Resources &amp; other digital material</b>
1. <a href="https://ocw.cs.pub.ro/courses/iot">https://ocw.cs.pub.ro/courses/iot</a>
2. <a href="https://education.ni.com/teach/resources/1079/industrial-internet-of-things-laboratory">https://education.ni.com/teach/resources/1079/industrial-internet-of-things-laboratory</a>