

INTERNET OF THINGS

| | | | | | |
|--|----------|---------------------------------|--------------|----------------------|--------|
| Course Code | 19ES1501 | Year | III | Semester | I |
| Course Category | ES | Branch | All Branches | Course Type | Theory |
| Credits | 2 | L-T-P | 2-0-0 | Prerequisites | Nil |
| 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

| | |
|------------|--|
| CO1 | Summarize the genesis and impact of IoT applications, architectures in real world. (L2). |
| CO2 | Illustrate diverse methods of deploying smart objects and connect them to network (L3). |
| CO3 | Construct simple applications using Arduino. (L3). |
| CO4 | Interpret different protocols and select which protocol can be used for a specific application (L2). |
| CO5 | Identify and develop a solution for a given application using APIs (L3). |

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 | PO10 | PO11 | PO 12 | PSO 1 | PSO 2 |
|------------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO1 | 2 | | 2 | 2 | 2 | 3 | 3 | | | | | 2 | 3 | 3 |
| CO2 | 2 | | 2 | 2 | 2 | 3 | 3 | | | | | 2 | 3 | 3 |
| CO3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | | | | | 2 | 3 | 3 |
| CO4 | 3 | 3 | 3 | 3 | | | 2 | | | | | 2 | 3 | 3 |
| CO5 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | | | 3 | 3 | 3 | 3 |

Syllabus

| Unit No. | Contents | Mapped CO |
|------------|---|------------|
| I | Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT and IoT, IoT Challenges, IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures, A Simplified IoT Architecture, The Core IoT Functional Stack, IoT Data Management and Compute Stack. | CO1 |
| II | Smart Objects: The Things in IoT, Sensors, Actuators, and Smart Objects, Sensor Networks, Connecting Smart Objects, Communications Criteria, IoT Access Technologies. | CO2 |
| III | Embedded Computing Basics, Microcontrollers, System-on-Chips, Choosing Your Platform, Arduino, Developing on the Arduino, Some Notes on the Hardware, Openness | 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. | CO4 |
| V | Prototyping Online Components: Getting Started with an API, Mashing Up APIs, Scraping, Legalities, Writing a New API, Clockodillo, Security, Implementing the API, Using Curl to Test, Going Further, Real-Time Reactions, Polling, Comet, Other Protocols, MQ Telemetry Transport, Extensible Messaging and Presence Protocol, Constrained Application Protocol. | 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, 1stEdition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743) | |
| Reference Books | |
| <ol style="list-style-type: none"> 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 | |