

Department of Computer Science Engineering – (Data Science)

COURSE MODULE OF THE COURSE TAUGHT FOR THE SESSION 2024-25 (ODD SEM)

Course Syllabi with CO's

| Faculty Name: Dr. Vinod Kumar P | | | | Academic Year: 2024 - 2025 | | | |
|---|---|-----------------|--|----------------------------|---|---|---------------------|
| Department: Computer Science & Engineering- Data Science | | | | | | | |
| Course Code | Course Title | Core / Elective | Prerequisite | Contact Hours | | | Total Hrs/ Sessions |
| | | | | L | T | P | |
| 21CS735 | Internet of Things | Elective | Knowledge about networking and sensors | 3 | 0 | 0 | 40 |
| Course Objectives | <ol style="list-style-type: none"> Understand about the fundamentals of Internet of Things and its building blocks along with their characteristics. Understand the recent application domains of IoT in everyday life. Understand the protocols and standards designed for IoT and the current research on it. Understand the other associated technologies like cloud and fog computing in the domain of IoT. Improve their knowledge about the various cutting-edge technologies in the field IoT and machine learning applications. Gain insights about the current trends of machine learning and AI techniques used in IoT to orient towards the present industrial scenario. | | | | | | |
| Topics Covered as per Syllabus | | | | | | | |
| <p>Module-1 Emergence of IoT: Introduction, Evolution of IoT, Enabling IoT and the Complex Interdependence of Technologies, IoT Networking Components, Addressing Strategies in IoT.</p> <p>Module-2 IoT Sensing and Actuation: Introduction, Sensors, Sensor Characteristics, Sensorial Deviations, Sensing Types, Sensing Considerations, Actuators, Actuator Types, Actuator Characteristics.</p> <p>Module-3 IoT Processing Topologies and Types: Data Format, Importance of Processing in IoT, Processing Topologies, IoT Device Design and Selection Considerations, Processing Offloading.</p> <p>Module-4 IoT Connectivity Technologies: Introduction, IEEE 802.15.4, Zigbee, Thread, ISA100.11A, WirelessHART, RFID, NFC, DASH7, Z-Wave, Weightless, Sigfox, LoRa, NB-IoT, Wi-Fi, Bluetooth</p> | | | | | | | |

Department of Computer Science Engineering – (Data Science)

Module-5

IoT Communication Technologies: Introduction, Infrastructure Protocols, Discovery Protocols, Data Protocols, Identification Protocols, Device Management, Semantic Protocols
IoT Interoperability: Introduction, Taxonomy of interoperability, Standards, Framework

List of Textbook and Reference book

Textbook

1. Sudip Misra, Anandarup Mukherjee, Arijit Roy, “Introduction to IoT”, Cambridge University Press 2021.

Reference Books

1. S. Misra, C. Roy, and A. Mukherjee, 2020. Introduction to Industrial Internet of Things and Industry 4.0. CRC Press.
2. Vijay Madiseti and Arshdeep Bahga, “Internet of Things (A Hands-on-Approach)”, 1st Edition, VPT, 2014.
3. Francis daCosta, “Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”, 1st Edition, Apress Publications, 2013.

Web links and Video Lectures (e-Resources)

<https://nptel.ac.in/noc/courses/noc19/SEM1/noc19-cs31/>

Course Outcomes

At the end of the course, the student will be able to:

- CO1. **Understand** the evolution of IoT, IoT networking components, and addressing strategies in IoT.
- CO2. **Analyze** various sensing devices and actuator types.
- CO3. **Demonstrate** the processing in IoT.
- CO4. **Apply** different connectivity technologies.
- CO5. **Understand** the communication technologies, protocols and interoperability in IoT.

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Internal Assessment Marks: 50 (Continuous Internal Evaluation: Three Unit Tests each of 20 Marks (duration 01 hour), Two assignments each of 10 Marks

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**.

Department of Computer Science Engineering – (Data Science)

The Correlation of Course Outcomes (CO's) and Program Outcomes (PO's)

| | | | | | | | | | | | | |
|-------------------------|------------------|--------------------------------|------|------|------|------|------|---------------|-------------------|-------|-------|-------|
| Course Code: | 21CS735 | TITLE: Internet of Things(IoT) | | | | | | Faculty Name: | Dr. Vinod Kumar P | | | |
| List of Course Outcomes | Program Outcomes | | | | | | | | | | | |
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
| CO-1 | 3 | | - | - | - | - | - | - | - | - | - | 2 |
| CO-2 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| CO-3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| CO-4 | 3 | 2 | - | - | 2 | - | - | - | - | - | - | 2 |
| CO-5 | 3 | 2 | - | - | 2 | - | - | - | - | - | - | 2 |

Note: 3 = Strong Contribution, 2 = Average Contribution, 1 = Weak Contribution, - = No Contribution

The Correlation of Course Outcomes (CO's) and Program Specific Outcomes (PSO's)

| Course Code | 21CS735 | Title: Internet of Things (IoT) | Faculty name: Dr. Vinod Kumar P |
|-------------------------|---------------------------|---------------------------------|---------------------------------|
| List of Course Outcomes | Program Specific Outcomes | | |
| | PSO1 | PSO2 | PSO3 |
| CO1 | 2 | - | - |
| CO2 | 2 | - | - |
| CO3 | 2 | - | - |
| CO4 | 2 | - | - |
| CO5 | 2 | - | - |

Note: 3 = Strong Contribution, 2 = Average Contribution, 1 = Weak Contribution, - = No Contribution