

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		
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

Module-1

Emergence of IoT: Introduction, Evolution of IoT, Enabling IoT and the Complex Interdependence of Technologies, IoT Networking Components, Addressing Strategies in IoT.

Module-2

IoT Sensing and Actuation: Introduction, Sensors, Sensor Characteristics, Sensorial Deviations, Sensing Types, Sensing Considerations, Actuators, Actuator Types, Actuator Characteristics.

Module-3

IoT Processing Topologies and Types: Data Format, Importance of Processing in IoT, Processing Topologies, IoT Device Design and Selection Considerations, Processing Offloading.

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

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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 Madisetti 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**.

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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