DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE MODULE

Faculty Name: Roopa B					Academic Year: 2025 - 26			
Department: Computer Science & Engineering								
Course Code	**Course Title**	**Core / Elective**	**Prerequisite**		**Contact Hours**			**Total Hrs/ Sessions**
					L	T	P	
BCS701	Internet of Things	Core	Networking, Basic programming Knowledge		3	0	2	40T + 8-10 lab sessions
Course Objectives	1. Understand the fundamentals of Internet of Things and its building blocks along with their characteristics. 2. Understand the recent application domains of IoT in everyday life. 3. Understand the protocols and standards designed for IoT and the current research on it. 4. Understand the other associated technologies like cloud and fog computing in the domain of IoT. 5. Improve their knowledge about the various cutting-edge technologies in the field of IoT and machine learning applications. 6. 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

Introduction to Internet of Things: Introduction, Physical design of IOT, Logical Design of IOT, IOT enabling technologies, IOT Levels & Deployment Templates.

Module-2

IOT and M2M: Introduction to M2M, Difference between IoT and M2M, SDN and NFV for IOT, **IOT System Management with NETCONF-YANG:** Need for IOT Systems Management, Simple Network Management Protocol (SNMP), Network operator requirements, NETCONF, YANG, IoT Systems Management with NETCONF-YANG.

Module-3

IoT Platforms Design Methodology: Introduction, IoT Design Methodology, Case Study on IoT System for Weather Monitoring, **loT Systems - Logical Design using Python:** Introduction, Installing Python, Python Data Types and Data structures, Control flow, Functions, Modules, Packages, File Handling, Operations, Classes, Python Packages of Interest for IoT.

Module-4

IoT Physical Devices & End points: What is a loT Device, Raspberry Pi, About the Board, Linux on Raspberry Pi, Raspberry Pi interfaces, Programming Raspberry Pi with Python, Case Studies illustrating IoT design – Home Automation, Cities, Agriculture.

Module-5

Data Analytics for IoT: Introduction, Apache Hadoop, Using Hadoop MapReduce for Batch Data Analytics, Apache Oozie, Apache Spark, Apache Storm, Using Apache Storm for Real-time Data Analysis.

Practical Component of IPCC

1. Develop a program to blink 5 LEDs back and forth.
2. Develop a program to interface a relay with Arduino board.
3. Develop a program to deploy an intrusion detection system using Ultrasonic and sound sensors.
4. Develop a program to control a DC motor with Arduino board.
5. Develop a program to deploy smart street light system using LDR sensor.
6. Develop a program to classify dry and wet waste with the Moisture sensor (DHT22).
7. Develop a program to read the pH value of various substances like milk, lime and water.
8. Develop a program to detect gas leakage in the surrounding environment.
9. Develop a program to demonstrate weather station readings using Arduino.
10. Develop a program to set up a UART protocol and pass a string through the protocol.
11. Develop a water level depth detection system using Ultrasonic sensor.
12. Develop a program to simulate interfacing with the keypad module to record the keystrokes.

List of Textbook

1. Arshdeep Bahga, Vijay Madisetti, " Internet of Things- A Hands On Approach", Universities press, 2014.

List of Reference books

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry,"IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", 1st Edition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)
2. Srinivasa K G, "Internet of Things", CENGAGE Leaning India, 2017.

Weblinks and Video Lectures (e-Resources)

Web links and Video Lectures (e-Resources):
https://nptel.ac.in/noc/courses/noc19/SEM1/noc19-cs31/
https://docs.arduino.cc/
https://www.arduino.cc/education/certification
https://www.udemy.com/topic/arduino/

0821-2954081
0821-2954011

info@atme.edu.in
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13th Kilometer, Mysore -Kanakapura
-Bengaluru Road, Mysore - 570 028

	At the end of the course the student will be able to:
Course Outcomes	1. Describe the basics of the Internet of Things, including its design, technologies, and different types of deployments.
	2. Explain the concepts of IoT and M2M and describe the use of network management protocols
	3. Apply basic IoT design steps and programming to create simple IoT applications
	4. Describe the architecture and interfaces of Raspberry Pi and implement Python-based IoT applications for different domains
	5. Elaborate the need for Data Analytics in IoT.

Internal Assessment Marks:

CIE marks for the theory component are 25 marks and that for the practical component is 25 marks.

- 25 marks for the theory component are split into 15 marks for two Internal Assessment Tests and 10 marks for other assessment methods.
- 15 marks for the conduction of the experiment and preparation of laboratory record, and 10 marks for the test conducted after the completion of all the laboratory sessions.

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

Subject Code:	BCS701		TITLE: Internet of Things					Faculty Name:		Roopa B	
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
CO-1	2	2	1	1	2	-	-	1	2	1	2
CO-2	2	2	1	-	1	-	-	-	-	-	1
CO-3	3	3	3	3	3	-	-	1	2	1	1
CO-4	3	2	2	2	2	-	-	-	-	-	1
CO-5	2	2	1	2	1	-	-	-	-	-	1

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)

Subject Code:	BCS701	TITLE: Internet of Things	Faculty Name:	Roopa B
Course Outcomes	**Program Specific Outcomes**			
	PSO-1		**PSO-2**	
CO-1	1		3	
CO-2	1		2	
CO-3	2		3	
CO-4	1		3	
CO-5	2		-	