CS – 26 FUNDAMENTALS OF IoT

Objectives:

- Understand the fundamental concepts and principles of the Internet of Things.
- Explore the architecture, components and technologies used in IoT systems.
- Learn about different communication protocols and standards for IoT.
- Gain insights into the design considerations and challenges in developing IoT solutions.
- Acquire practical skills in designing and implementing IoT systems.

Prerequisites:

- Basic knowledge of computer networks and protocols
- Familiarity with programming languages such as C / C++

Unit No.	Topic	Detail
1	**Introduction to IoT**	• Introduction to the Internet of Things (IoT) • History and Evolution of IoT • Key Concepts and Definitions • Applications and Use Cases of IoT • Challenges and Opportunities in IoT
2	**IoT Architecture and Technologies**	• Conceptual Framework • IoT Architecture Overview • Technology behind IoT • Sources of the IoT • M2M Communication • IoT Examples

3	**Hardware for IoT**	• Sensors
		• Digital Sensors
		• Actuators
		• Radio Frequency Identification (RFID) Technology
		• Wireless sensor networks
		• Overview of IoT supported Hardware platforms:
		  ○ Arduino
		  ○ Netduino

Seminar - 5 Lectures
Expert Talk - 5 Lectures
Test - 5 Lectures

Total Lectures 30 + 15 = 45

Reference Books:

- "Internet of Things (A Hands-on Approach)" b Arshdeep Bahga and Vijay Madisetti
- "Building the Internet of Things: Implement New Business Models, Disrupt Competitors, Transform Your Industry" by Maciej Kranz
- "Designing Connected Products: UX for Consumer Internet of Things" by Claire Rowland, Elizabeth Goodman, Martin Charlier, Ann Light, and Alfred Lui

Course Outcomes:

- Explain the concept and significance of the Internet of Things in various domains.
- Describe the architecture and components of IoT systems, including sensors, actuators, and communication protocols.
- Analyze different IoT communication protocols and select appropriate protocols for specific IoT applications.
- Identify design considerations and challenges in developing scalable and secure IoT solutions.