Pervasive and Ubiquitous Computing	L	T	P	Mobile Networks, Sensors, Networks, Security
	3	1	0	

Course Objective: To familiarize students with the concepts and utility of Pervasive and Ubiquitous Computing.

S. NO	Course Outcomes (CO)
CO1	Understand the Core Concepts and Technologies of Pervasive and Ubiquitous Computing
CO2	Design and Develop Context-Aware Ubiquitous Systems
CO3	Address Security and Privacy Challenges in Ubiquitous Environments
CO4	Explore and Apply Emerging Trends in Pervasive Computing

S. NO	Contents	Contact Hours
UNIT 1	Introduction to Pervasive and Ubiquitous Computing: Definition and concepts of pervasive and ubiquitous computing. Evolution from traditional computing to pervasive environments. Key characteristics: invisibility, context-awareness, and adaptive behavior.	8

UNIT 2	Enabling Technologies: Wireless Communication Wi-Fi, Bluetooth, Zigbee, RFID, and NFC. Mobile and sensor networks. Embedded Systems Microcontrollers, embedded operating systems. Internet of Things (IoT) devices and platforms. Context-Aware Computing Sensors and context acquisition. Context modeling and reasoning.	**10**
UNIT 3	Human-Computer Interaction (HCI): Natural User Interfaces (NUIs) Touch, gesture, voice recognition. Wearable Computing Wearable devices and their interaction models. Augmented Reality (AR) Integration of AR in ubiquitous systems.	**8**
UNIT 4	Middleware for Ubiquitous Computing Middleware Architectures and Service-oriented architecture (SOA): Event-driven and agent-based middleware. Resource Management Context-aware resource allocation. Power management in pervasive environments. **Security and Privacy:** Challenges in Pervasive Computing , Authentication, data privacy, and access control. Privacy-Preserving Techniques	**8**
UNIT 5	**Applications of Pervasive Computing** Smart Homes and Buildings, Automation, energy management, and security systems, Healthcare Wearable health monitors, remote patient monitoring. Smart Cities Transportation systems, environmental monitoring, Retail and Marketing, Location-based services, personalized advertising.	**8**
	TOTAL	**42**

REFERENCES		
S.No.	**Name of Books/Authors/Publishers**	**Year of Publication /**