

FACULTY OF COMPUTER APPLICATIONS

Programme	Master of Computer Applications					Branch/Spec.	Computer Application		
Semester	II					Version	1.0.0.0		
Effective from Academic Year				2026-27		Effective for the batch Admitted in		July 2026	
Subject Code	P12E6SWC		Subject Name			Sensors & Wireless Communication			
Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	2	0	2	0	4	Theory	40	60	100
Hours	2	0	4	0	6	Practical	20	30	50

Objective:

- Understand sensing technologies used in IoT.
- Learn actuator control techniques.
- Explore wireless communication protocols.
- Develop sensor-based smart applications.

Pre-requisites:

- Embedded Systems, Basic Electronics, Computer Networks

Course Outcomes:

Name of CO	Description
CO1	Explain different sensors and actuator technologies
CO2	Interface sensors and actuators with embedded platforms.
CO3	Implement wireless communication using IoT protocols.
CO4	Develop wireless sensor network-based IoT applications.

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	3	2	1	2	–	–	–	1
CO2	2	3	3	3	2	1	1	2
CO3	2	3	3	3	2	1	2	2
CO4	2	3	3	3	2	2	2	3

Content:		
Unit	SECTION – I	Hrs
1	Sensors and Signal Acquisition: Sensor Fundamentals, Analog & Digital Sensors, Environmental Sensors, Motion Sensors, Biomedical Sensors, Industrial Sensors, Sensor Calibration, Data Acquisition	07
2	Actuators: Relay, Solenoid, DC Motor, Stepper Motor, Servo Motor, Pneumatic Actuators, Smart Actuators, Industrial Control	08
SECTION – II		
3	Wireless Communication: Bluetooth/BLE, Wi-Fi, ZigBee, LoRaWAN, RFID, NFC, Thread, 6LoWPAN	08
4	IoT Communication Protocols: MQTT, CoAP, HTTP/HTTPS, WebSocket, AMQP, Edge Gateway Communication, Wireless Sensor Networks, Smart Monitoring Applications	07
Practical Content:		
List of programs specified by the subject teacher based on above mentioned topics		
Text Books:		
1	Arshdeep Bahga & Vijay Madisetti , <i>Internet of Things: A Hands-on Approach</i> , Universities Press.	
2	Perry Lea , <i>Internet of Things for Architects</i> , Packt Publishing.	
3	David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton & Jerome Henry , <i>IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things</i> , Cisco Press.	
4	Jacob Fraden , <i>Handbook of Modern Sensors: Physics, Designs, and Applications</i> , 5th Edition, Springer.	
5	John G. Webster & Halit Eren (Editors) , <i>Measurement, Instrumentation, and Sensors Handbook</i> , 2nd Edition, CRC Press.	
Reference Books:		
1.	Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos & David Boyle , <i>From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence</i> , Academic Press (Elsevier).	
2.	Olivier Hersent, David Boswarthick & Omar Elloumi , <i>The Internet of Things: Key Applications and Protocols</i> , 2nd Edition, Wiley.	
3.	Charles Bell , <i>Beginning Sensor Networks with Arduino and Raspberry Pi</i> , Apress.	
4.	Dogan Ibrahim , <i>Advanced PIC Microcontroller Projects in C: From USB to RTOS with the PIC18F Series</i> , Newnes (Elsevier).	
5.	Raj Kamal , <i>Internet of Things: Architecture and Design Principles</i> , McGraw-Hill Education.	
Web References / MOOC / Certification Course		
1	NPTEL – Internet of Things, https://nptel.ac.in/courses	
2	Cisco Networking Academy – Introduction to IoT, https://www.netacad.com/courses/iot	
3	The Things Network Documentation, https://www.thethingsnetwork.org/docs/	
4	Bluetooth SIG – Bluetooth LE Developer Resources, https://www.bluetooth.com/develop-with-	

	bluetooth/
5	Coursera – Introduction and Programming with IoT Boards (University of California, Irvine), https://www.coursera.org/learn/iot-devices
Question Paper Scheme:	
	University Examination Duration: 3 Hours Note for Examiner: - (I) Questions 1 and 4 are compulsory with no options. (II) Internal options should be given in questions 2, 3, 5 and 6. SECTION – I Q.1 –8 Marks Q.2 –11 Marks Q.3 –11 Marks SECTION - II Q.4 –8 Marks Q.5 –11 Marks Q.6 –11 Marks