

IV B. Tech – I Semester
(20EC7328) WIRELESS SENSOR NETWORKS
(Program Elective-V)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	0	0	3

Course Objectives:

- To understand the fundamentals of wireless sensor networks and its application to emerging domains
- To understand the Adhoc networks and Gateway concepts
- To understand MAC protocols
- To understand Routing protocols and its classification
- To understand the problems concerning to wireless sensor networks and challenges involved in managing a sensor network

UNIT-1

Introduction: Fundamentals of wireless communication technology, the electromagnetic spectrum radio propagation, characteristics of wireless channels, modulation techniques, multiple access techniques, wireless LANs, PANs, WANs, and MANs, Wireless Internet.

UNIT-2

Introduction to Adhoc/sensor networks, unique constraints and challenges, advantage of sensor networks, applications of sensor networks, Types of wireless sensor networks, Enabling Technologies for WSNs. Single node architecture – Hardware Components, Energy consumption of sensor nodes, Operating system and execution environment, Network architecture-Sensor network scenarios. Optimization goals, Figures of merits, Gate way concepts.

UNIT-3

MAC Protocols: Issues in designing MAC protocols for adhoc wireless networks, design goals, classification of MAC protocols, MAC protocols for sensor network, location discovery, quality, other issues, S-MAC, IEEE 802.15.4

UNIT-4

Routing Protocols: Issues in designing a routing protocol, classification of routing protocols, table-driven, on-demand, hybrid, flooding, hierarchical, and power aware routing protocols.

UNIT-5

QoS and Energy Management: Issues and Challenges in providing QoS, classifications, MAC, network layer solutions, QoS frameworks, need for energy management, classification, battery, transmission power, and system power management schemes.

Course Outcomes:

After successful completion of the course, the students can be able to:

S. No.	Course Outcomes	BTL
1	Describe the characteristics of wireless sensor networks (WSNs)	L2
2	Understand the architecture and enabling technologies of WSNs	L2
3	Classify the design issues and different categories of MAC protocols	L4
4	Explain the various Adhoc routing protocols and transport layer mechanisms	L2
5	Analyze the issues and challenges in providing QoS	L4

Correlation of Cos with Pos and PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	-	-	-	3	-
CO2	3	3	2	1	-	-	-	-	-	-	-	-	3	-
CO3	3	3	2	1	-	-	-	-	-	-	-	-	3	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	3	-
CO5	3	2	2	2	1	1	-	-	-	-	-	-	3	-

Text Books:

1. Feng Zhao and Leonides J. Guibas, "Wireless sensor networks ", Elsevier publication – 2007
2. C. Siva Ram Murthy, and B. S. Manoj, "AdHoc Wireless networks ", Pearson Education - 2008.

Reference Books:

1. Jochen Schiller, "Mobile Communications", Pearson Education, 2nd Edition, 2003.
2. Kazern Sohraby, Daniel Minoli, & Taieb Znati, "Wireless Sensor Networks- Technology, Protocols, and Applications", John Wiley, 2007.
3. William Stallings, "Wireless Communications and Networks ", Pearson Education - 2004