

4/4 B.Tech. EIGHTH SEMESTER  
ELECTIVE – V

EM8T4B

WIRE LESS SENSOR NETWORKS

Credits: 3

Lecture: 3 periods/week

Internal assessment: 30 marks

Tutorial: 1 period /week

Semester end examination: 70 marks

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**Course Objectives :**

- To teach the general principles and applications of wireless sensor networks
- To the state of the art in information processing in wireless sensor networks.

**Learning Outcomes**

On successful completion of this course the student will be able to:

- Design, implement and maintain wireless sensor networks.
- Wireless technology for distributed sensor networks platforms,
- Understand Routing ,Security principles and protocols for WSN
- Understand Network support and management, localization, topology control of Wireless sensor Networks

UNIT I

**OVERVIEW OF WIRELESS SENSOR NETWORKS** :Challenges for Wireless Sensor Networks, Enabling Technologies For Wireless Sensor Networks.

UNIT II

**ARCHITECTURES** : Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes , Operating Systems and Execution Environments.

UNIT III

**NETWORK ARCHITECTURE** -Sensor Network Scenarios, Optimization Goals and Figures of Merit, Gateway Concepts.

UNIT IV

**NETWORKING SENSORS - I:** Physical Layer and Transceiver Design Considerations, MAC Protocols for Wireless Sensor Networks, Low Duty Cycle Protocols And Wakeup Concepts - S-MAC,

UNIT V:

**NETWORKING SENSORS - II:** The Mediation Device Protocol, Wakeup Radio Concepts, Address and Name Management, Assignment of MAC Addresses, Routing Protocols- Energy-Efficient Routing, Geographic Routing.

UNIT VI:

**INFRASTRUCTURE ESTABLISHMENT:** Topology Control, Clustering, Time Synchronization, Localization and Positioning, Sensor Tasking and Control.

UNIT VII

**SENSOR NETWORK PLATFORMS AND TOOLS – I:** Sensor Node Hardware – Berkeley Motes, Programming Challenges.

UNIT VIII

**SENSOR NETWORK PLATFORMS AND TOOLS –II :** Node-level software platforms, Node-level Simulators, State-centric programming.

TEXT BOOKS:

1. Holger Karl & Andreas Willig, " Protocols And Architectures for Wireless Sensor Networks" , John Wiley, 2005.
2. Feng Zhao & Leonidas J. Guibas, "Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.

REFERENCES:

1. Kazem Sohraby, Daniel Minoli, & Taieb Znati, "Wireless Sensor Networks- Technology, Protocols, And Applications", John Wiley, 2007.
2. Anna Hac, "Wireless Sensor Network Designs", John Wiley, 2003.