Electives in Networks

19CSE339	WIRELESS SENSOR NETWORKS	L-T-P-C: 3-0-0-3

Pre-Requisite(s): 19CSE301 Computer Networks

Course Objectives

- This course introduces the features of Wireless Sensor Networks and their architecture.
- The protocols of MAC and Network layer are discussed in detail.
- The course emphasizes on localization and positioning scheme for real time applications.

Course Outcomes

CO1: Understand the basic features of Wireless Sensor networks
CO2: Understand and apply the features of different Wireless sensor Architectures for real world scenarios.
CO3: Understand and apply the protocols of MAC and Network layer for real world Wireless sensor networks
CO4: Understand and Apply Localization and Positioning schemes
CO5: Design Wireless sensor network for Real time Applications

CO-PO Mapping

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

Syllabus

Unit 1
Overview of WSN: Introduction, Applications, Unique Constraints and challenges. Platforms for WSN: Sensor Node Hardwares (Introduction): Mica2, TelosB, Cricket, i-Mote2, TMote, BTnode, Wasp mote, Comparisons of these based on the specifications. Sensor Node Software's (Introduction): TinyOS and Contiki .Programming Tools: C, nesC. Single node architecture – Energy consumption of sensor nodes.

Unit 2
Network Architecture – Sensor network scenario-Design principles of WSN-Physical layer and transceiver design considerations in WSNs.MAC Protocols: Fundamentals of MAC protocols, Low Duty cycle Protocols and wake up concepts: SMAC, STEM, Contention Based Protocols: CSMA, PAMAS, Scheduling based Protocols: LEACH, SMACS, TRAMA.

Unit 3

Routing: Gossiping and agent –based unicast forwarding – Energy efficient unicast – Broadcast and multicast – geographic routing -. Localization and Positioning: GPS based localization; Event Driven Localization- Overview of data aggregation -Wireless Sensor Network for Specific use case.

Text Book(s)

Karl H, Willig A. Protocols and architectures for Wireless Sensor Networks. John Wiley & Sons; 2005.

Reference(s)

Dargie W, Poellabauer C. Fundamentals of Wireless Sensor Networks: theory and practice. John Wiley & Sons; 2010 Nov 5.

Zhao F, Guibas LJ, Guibas L. Wireless Sensor Networks: an information processing approach. Morgan Kaufmann; 2004 Jul 20.

Anna Hac. Wireless Sensor Networks Designs, John Wiley and Sons; 2004.

Evaluation Pattern

Assessment	Internal	External
Periodical 1 (P1)	15	
Periodical 2 (P2)	15	
*Continuous Assessment (CA)	20	
End Semester		50

*CA – Can be Quizzes, Assignment, Projects, and Reports