

Course Code: ICE M1141

Course Title: Wireless Sensor Networks

Credit: 4.0, 100 (70%+20%+10%) Marks, 4 Hours/week, Lectures: 52, Exam time: 3 hours

Course Contents

Section-A

Introduction: Background of wireless sensor network (WSN) technology, applications of WSN, sensor node architecture, WSN architecture and protocol stack, design principles of WSN.

Physical Layer and Medium Access Control (MAC) Aspects: Wireless channel, PHY layer standards, IEEE 802.15.4, fundamentals of MAC protocols, low duty cycle schemes, contention-based schemes, schedule-based schemes.

Link Layer Aspects: Error control, ARQ technique, FEC technique, hybrid technique, framing, naming and addressing issues.

Section-B

Topology Control and Network Layer Aspects: Topology control in flat networks, hierarchical networks, Challenges for routing, data-centric and flat-architectural protocols, hierarchical protocols, geographic routing.

Time Synchronization and Localization: Challenges for time synchronization, time synchronization techniques in WSN, challenges in localization, ranging techniques, rangebased localization protocols, range-free localization protocols.

Transport Layer Aspects: Challenges for transport layer, reliable data transport, single packet delivery, block delivery, congestion control and rate control in WSN.

Books Recommended:

1. Protocols and Architectures for Wireless Sensor Networks, : Holger Karl and Andreas Willig, John Willey and Sons Ltd.
2. Wireless Sensor Networks, :Ian F. Akyildiz and Mehmet Can Vuran, John Willey and Sons Ltd.
3. Wireless Sensor Networks Technology, Protocols and Applications : Kazem Sohraby, Daniel Minoli, and Taieb Znati, John Willey and Sons Ltd.