MSCS206 WIRELESS SENSOR NETWORK (3-0-0)

Module I: 8 Hours

Introduction: Overview of WSN & its technology, motivation & applications, Taxonomy of WSN technologies, Traditional layered stack, Cross-layer designs, Sensor network architecture.

Sensor Node Technology: Overview, Hardware & software, Sensor taxonomy, Wireless network trends, Wireless transmission technology & systems, Radio technology primer, Available wireless technologies

Module II: 12 Hours

Medium access control protocols for WSN, Fundamentals of MAC protocols, MAC protocols for WSNs, Sensor-MAC case study, IEEE 802.15.4 LR-WPANs Standard case study, MAC protocols analysis using Markov Chain.

Routing Protocols: Data dissemination & gathering, Routing challenges, design issues, and strategies; Transport Control Protocols: Design issues, Resource aware routing, Data-centric routing, Geographic routing, and Opportunistic routing.

Module III: 8 Hours

WSN Middleware: Principles, Architecture, Existing middleware, Network management - requirements, traditional models, design issues; Security issues of WSN: Possible attacks, Countermeasures, Static & dynamic key distribution.

Module IV: 8 Hours

WSN Platforms & Tools: Sensor node Hardware, Berkeley Motes, Programming challenges, Node-level software platforms, Node-level simulators, State-centric programming; Applications of WSNs: Ultra wide band radio communication, Wireless fidelity systems

Text Books:

1. W. Dargie and C. Poellabauer, Fundamentals of Wireless Sensor Networks - Theory and Practice, Wiley,2010.
2. K. Sohraby, D. Minoli, and T. Znati, Wireless Sensor Networks - Technology, Protocols, and Applications, 1st Edition, Wiley Inter Science, 2007.

Reference Books:

1. T. Hara, V. I. Zadorozhny, and E. Buchmann, Wireless Sensor Network - Technologies for the Information Explosion Era, Springer, 2012.
2. B. Krishnamachari, Networking Wireless Sensors, Cambridge University Press, 2005.