

Ad-Hoc and Sensor Networks

Course Objective:

- To know the constraints of the wireless physical layer that affect the design and performance of ad hoc and sensor networks, protocols, and applications.
- To understand MAC, Routing protocols that have been proposed for ad hoc and sensor networks.
- To understand the energy issues in sensor networks and how they can be addressed using scheduling, media access control, and special hardware.
- To explain various security threats to ad hoc networks and describe proposed solutions

UNIT I. Introduction of ad-hoc/sensor networks

Key definitions of ad-hoc/sensor networks, Advantages of ad-hoc/sensor networks, Unique constraints and challenges, Driving Applications. Wireless Communications/Radio Characteristics

UNIT II: Ad-Hoc wireless networks

Media Access Control (MAC) Protocols

Issues in designing MAC protocols, Classifications of MAC protocols, MAC protocols

UNIT III: Routing Protocols

Issues in designing routing protocols, Classification of routing protocols, Routing protocols
Networking Sensors

Unique features, Deployment of ad-hoc/sensor network, Sensor tasking and control, Transport layer and security protocols

UNIT IV:

Sensor Network Platforms and Tools

Berkley Motes, Sensor network programming challenges, Embedded Operating System, Simulators.

UNIT V

Applications of Ad-Hoc/Sensor Network and Future Directions, Ultra wide band radio communication, Wireless fidelity systems

Textbooks

1. Holger Karl and Andreas Willig Protocols and Architectures for Wireless Sensor Networks WILEY (ISBN: 0-470-09510-5)
2. Ad Hoc Wireless Networks: Architectures and Protocols by C. Siva Ram Murthy and B. S. Manoj (Prentice Hall, 2004)
3. Wireless Sensor Networks: An Information Processing Approach by Feng Zhao and Leonidas J. Guibas (Morgan Kaufmann, 2004)

