

20CS011 MOBILE ADHOC NETWORKS

Hours Per Week :

L	T	P	C
3	-	-	3

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
45	-	-	15	30	-	5	5	-

Course Description and Objectives:

The proposed course covers Ad-Hoc Networks in which structure of networks varying with respect to time. In real life these networks play vital role in advanced communication system. The best practical examples of Ad-Hoc Networks is VANETs, it is practical implementation of Ad-Hoc networks to serve various on-demand application of internet users. Now-a-Days most of the applications require ad-hoc networks because of on-demand day-to-day needs. The proposed course covers research issues in various layers. One of the major concerns is energy management in Wireless Ad-Hoc Networks to design adaptive protocols. To analyse the various design issues and challenges in the layered architecture of Ad hoc wireless networks.

Course Outcomes:

Upon the Completion of the course, students will be able to:

- ✓ Compare the differences between cellular and adhoc networks and the analyse the challenges at various layers and applications
- ✓ Summarize the protocols used at the MAC layer and scheduling mechanisms
- ✓ Compare and analyse types of routing protocols used for unicast and multicast routing
- ✓ Examine the network security solution and routing mechanism
- ✓ Evaluate the energy management schemes and Quality of service solution in adhoc networks

SKILLS:

- ✓ Describe the unique issues in adhoc wireless networks.
- ✓ Describe current technology trends for the implementation and deployment of adhoc wireless networks.
- ✓ Discuss the challenges in designing MAC, routing and transport protocols for adhoc wireless networks.
- ✓ Discuss the issues in designing Security Protocols for adhoc wireless networks.
- ✓ Discuss about the issues in QoS solutions and Energy Management Schemes in adhoc Wireless Networks.

Unit I

Adhoc Wireless Networks: Cellular and adhoc wireless networks; Applications of adhoc wireless network; Issues in adhoc wireless networks-medium access scheme, routing, transport layer protocols, security and energy management; Adhoc wireless internet.

Unit II

MAC Protocols for Adhoc Wireless: Issues in designing a MAC Protocol; Classification of MAC Protocols; Contention based protocols; Contention based protocols with Reservation Mechanisms; Contention based protocols with Scheduling Mechanisms; Multi channel MAC; IEEE 802.11; IEEE Standards: 802.11a, 802.11b, 802.15; HIPERLAN.

Unit III

Routing Protocols: Issues in Designing a Routing Protocol for AdHoc Wireless Networks; Proactive Vs reactive routing; Classifications of Routing Protocols: Table driven routing protocols, On demand routing protocols, Hybrid routing protocols, Hierarchical routing protocols, Power aware routing protocols, Tree based and mesh based multicast routing protocols.

Unit IV

Quality of Service (QoS) in Adhoc Networks: Introduction to QoS; Issues and challenges involved in providing QoS; Classification of QoS solutions; Medium Access Control (MAC) Layer QoS solutions; Network layer QoS solutions; QoS model: QoS frameworks, INSIGNIA protocol commands, INSIGNIA protocol operations, Intelligent optimization self regulated adjustment (INORA): Coarse feedback scheme, Class based fine feedback scheme.

Unit V

Energy Management Systems in Adhoc Wireless Networks: Need for energy management; Classification of energy management schemes; Battery management schemes; Transmission power management schemes; System power management schemes.

TEXTBOOKS:

1. C. Siva Ram Murthy and B. S. Manoj, "Ad hoc Wireless Networks Architecture and Protocols", Pearson Edition, 2nd edition, 2007.

REFERENCEBOOKS:

1. Charles E. Perkins, "Ad hoc Networking", Addison – Wesley, 2000.
2. Stefano Basagni, Marco Conti, Silvia Giordano and Ivan Stojmenovic, "Mobile ad-hoc networking", Wiley-IEEE press, 2004.
3. Mohammad Ilyas, "The handbook of ad-hoc wireless networks", CRC press, 2002.