ADHOC NETWORKS
(ELECTIVE-II)

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Subject Code: 13EC2117

Course Outcomes:

Upon completion of the course the student will be able to,

CO1: Describe the unique issues in ad-hoc/sensor networks.

CO2: Describe current technology trends for the implementation and deployment of wireless ad-hoc/sensor networks.

CO3: Discuss the challenges in designing MAC, routing and transport protocols for wireless ad-hoc/sensor networks.

CO4: Discuss the challenges in designing routing and transport protocols for wireless Ad-hoc/sensor networks.

CO5: Comprehend the various sensor network Platforms, tools and applications.

UNIT-I
INTRODUCTION:

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.

Electromagnetic spectrum-Radio propagation mechanism- characteristics of the wireless channel Adhoc Wireless Networks – Heterogeneity in Mobile Devices – Wireless Sensor Networks – Traffic Profiles – Types of Adhoc Mobile Communications – Types of Mobile Host Movements – Challenges Facing Adhoc Mobile Networks – Adhoc Wireless Internet. Ad-Hoc wireless networks Introductions to lan, wan, man, pan architectures and applications.

UNIT-II
END TO END DELIVERY AND SECURITY:

Transport layer: Issues in designing- Transport layer classification, adhoc transport Protocols, Security issues in adhoc networks: issues and challenges, network security attacks, secure routing protocols Ad-Hoc wireless networks Introductions to local area networks, wide area networks, man, pan architectures and applications.

UNIT-III

MEDIA ACCESS CONTROL (MAC) PROTOCOLS:

Media Access Control (MAC) Protocols Introduction - Issues in Designing a MAC Protocol for Ad Hoc Wireless Networks – Classifications of MAC Protocol. MACAW – FAMA – BTMA – DPRMA – Real-Time MAC protocol – Multichannel Protocols – Power Aware MAC.

UNIT-IV

ROUTING PROTOCOLS:

Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks – Classifications
of Routing Protocols -Table-driven protocols – DSDV – WRP – CGSR – On-Demand protocols – DSR – AODV – TORA – LAR – ABR – Zone Routing Protocol – Power Aware Routing protocols

UNIT-V

NETWORKING SENSORS AND APPLICATIONS:

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

SENSOR NETWORK PLATFORMS AND TOOLS:

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

Applications:

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

TEXT BOOKS:

[1] Holger Karl and Andreas Willig, "*Protocols and Architectures for Wireless Sensor Networks*", WILEY lectures and applications (ISBN: 0-470-09510-5).

[2] C. Siva Ram Murthy and B. S. Manoj, "*Ad Hoc Wireless Networks: Architectures and Protocols*", Prentice Hall, 2004.

REFERENCE BOOKS:

[1] Feng Zhao and Leonidas J. Guibas, "*Wireless Sensor Networks: An Information Processing Approach*" (Morgan Kaufmann, 2004).

[2] Stefano Basagni, Marco Conti, Silvia Giordano and Ivan stojmenovic, "*Mobile ad hoc Networking*", Wiley-IEEE press, 2004.

[3] Mohammad Ilyas, "*The handbook of adhoc wireless networks*", CRC press, 2002.

[4] T. Camp, J. Boleng, and V. Davies "*A Survey of Mobility Models for Ad Hoc Network Research*," Wireless Commun. and Mobile Comp., Special Issue on Mobile Ad Hoc Networking Research, Trends and Applications, vol. 2, no. 5, 2002, pp. 483–502.