ADHOC NETWORKS
(ELECTIVE-II)

Course Code:15EC2117

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Pre requisites: Data communications, Computer networks, Digital communications.

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 (10-Lectures)

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.

UNIT II (10-Lectures)

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 (10-Lectures)

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 (10-Lectures)

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 (10-Lectures)

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. Karl, Holger, and Andreas Willig. "*Protocols and architectures for wireless sensor networks."* John Wiley & Sons, 2007.
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.