# 19CS41E4 - ADHOC & SENSOR NETWORKS

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| **Course Category:** | Professional Elective | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 3-0-0 |
| **Prerequisite:** | Wireless Sensor Networks | **Sessional Evaluation:****Univ.Exam Evaluation:****Total Marks:** | 4060100 |
| **Course Objectives** | * To study the fundamentals of wireless Ad-Hoc Networks.
* To study the operation and performance of various Adhoc wireless network protocols.
* To study the architecture and protocols of Wireless sensor networks.
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| **Course Outcomes** | Upon successful completion of the course, the students will be able to: |
| CO1 | Understanding the basis of Ad-hoc wireless networks. |
| CO2 | Learn the design, operation and the performance of MAC layer protocols of Adhoc wireless networks. |
| CO3 | Expose to the design, operation and the performance of Routing protocols of Adhoc wireless network. |
| CO4 |  Familiar with the Security protocols of Adhoc wireless networks. |
| CO5 | Distinguish between protocols used in Adhoc wireless network and wireless sensor networks. |
| CO6 | Describe the routing and power management in hybrid wireless networks. |
| **Course Content** | UNIT-I**Wireless LANs and PANs:** Introduction, Fundamentals of WLANS, IEEE 802.11 Standards, HIPERLAN Standard, Bluetooth, Home RF.**Ad Hoc Wireless Networks:** Introduction, Issues in Ad Hoc Wireless Networks.UNIT-II**MAC Protocols:** Introduction, Issues in Designing a MAC protocol for Ad Hoc Wireless Networks, Design goals of a MAC Protocol for Ad Hoc Wireless Networks, Classifications of MAC Protocols, Contention - Based Protocols, Contention - Based Protocols with reservation Mechanisms, Contention Based MAC Protocols with Scheduling Mechanisms.UNIT-III**Routing Protocols:** Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks, Classification of Routing Protocols, Table –Driven Routing Protocols, On – Demand Routing Protocols, Hybrid Routing Protocols.UNIT-IV**Security Protocols:** Security in Ad Hoc wireless networks, Network security requirements, Issues and Challenges in security provisioning, Network security attacks, Key management, Secure routing in Ad Hoc wireless Networks.UNIT-V**Wireless Sensor Networks:** Introduction, Sensor Network Architecture, Data Dissemination, Data Gathering, MAC Protocols for Sensor Networks, Location Discovery, Quality of a Sensor Network, Evolving Standards, Other Issues.UNIT-VI**Hybrid Wireless Networks:** Introduction, Next generation hybrid wireless architecture, Routing in Hybrid wireless networks, Pricing In multi-hop wireless networks, power control schemes in hybrid wireless networks, Load balancing in hybrid wireless networks. |
| **Text Books and References:** | **Text Books:*** + - 1. 1. C. Siva Ram Murthy, and B. S. Manoj, “Ad Hoc Wireless Networks: Architectures and Protocols “, Prentice Hall Professional Technical Reference, 2008.

**Reference Books:**1. Carlos De MoraisCordeiro, Dharma PrakashAgrawal “Ad Hoc & Sensor Networks: Theory and Applications”, World Scientific Publishing Company, 2006.2. Feng Zhao and LeonidesGuibas, “Wireless Sensor Networks”, Elsevier Publication – 2002.3.Holger Karl and Andreas Willig “Protocols and Architectures for Wireless Sensor Networks”, Wiley, 20054. KazemSohraby, Daniel Minoli, &TaiebZnati, “Wireless Sensor Networks-Technology, Protocols, and Applications”, John Wiley, 2007.5. Anna Hac, “Wireless Sensor Network Designs”, John Wiley, 2003. |
| **E-Resources** | 1. https://nptel.ac.in/courses
2. https://freevideolectures.com/university/iitm
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