

# C831 Dynamic Spectrum Access using Cognitive Radio Mobile Adhoc Networks

## Course Objective:

- To understand the essential functions of Cognitive Radio Mobile Adhoc Networks
- To understand the Interoperability between 802.11e/HSPDA
- To Understand the applications of Cognitive Radio Mobile Adhoc Networks

## UNIT 1 - Distributed Consensus based Cooperative Spectrum Sensing

Introduction, Background, Secondary User Network Modeling, Distributed Consensus based Cooperative Spectrum Sensing in fixed graph and random graph. Game theory for Cooperative and Non-Cooperative Modeling

## UNIT 2 -Spectrum Handoff

Introduction, Network coordination and Assumptions, Proactive Spectrum Handoff Protocol, Distributed channel selection algorithm, Performance Evaluation of Distributed channel selection algorithm, Three dimensional discrete time Markov model

## UNIT 3 -Spectrum Sharing in DS-CDMA/OFDM Wireless Mobile Networks

System Model, Impact of Primary service activity, Opportunistic Spectrum Sharing in DS-CDMA/OFDM systems, Single secondary Service user, Multiple Secondary service users

## UNIT 4 - Interoperability between IEEE 802.11e and HSDPA

HSDPA/Wifi Interoperability, Spectrum Aggregation between 2 and 5GHz Bands in HSDPA, IEEE 802.11e Ad-hoc Networking, Challenges for Hierarchical HSPDA/Wi-fi Scenario

## UNIT 5 - Applications of Cognitive Radio Mobile Adhoc Networks

Introduction, Cognitive Vehicular Networks, Distributed decision Making, Adaptive WiFi/WiMax Networking Platform, Cognitive Radio for Healthcare Automation Network: Research challenges, Cognitive Radio Testbed for healthcare automation network

## Text Books

1. F.Richard Yu, "Cognitive Radio Mobile Adhoc Networks" Springer 2011
2. Ekram Hossain, Dusit Niyato and Zhu Han, "Dynamic Spectrum access and Management in Cognitive Radio Networks" Cambridge University Press 2009