

COGNITIVE RADIO

17ECMC1T5A

Credits: 4

Lecture: 4 periods/week

Internal assessment: 40 marks

Semester end examination: 60 marks

Course Objectives

- Know the basics of the software defined radios.
- Learn the Systems – Level Architecture
- Know the basics of Cognitive radios
- Understand the concepts of security, regulations and standardization.

Course Outcomes

Upon completion of the course, students will be able to

- Describe the basics of the software defined radios.
- Analyze Systems – Level Architecture.
- Describe the basics of the Cognitive radios
- Deploy the Cognitive Radio Platforms and regulations

UNIT I

Software Radio Concepts

Introduction and Overview: The ideal Software Radio, Software Radio Functional Architecture, Basic signal processing streams. Implementation alterations, Acquisition of software radios, Architecture Evolution and Architecture implications.

UNIT II

Systems – Level Architecture Analysis

Disaster – Relief case study, Radio Resource Analysis, Network Architecture Analysis, Analysing the protocol stacks, System level architecture parameters, software Architecture Analysis

UNIT III

Introduction to Cognitive Radio

Software Defined Radio, Cognitive Radio, features and capabilities, Research Challenges in Cognitive Radio |Architecture for next generation networks.

UNIT IV

Cognitive Radio Platforms

Security in Cognitive Radio, Cognitive Radio Platforms Regulations and standardization

Text Books:

1. Joseph Mitola III, "Software Radio Architecture: Object-Oriented Approaches to Wireless System Engineering", John Wiley & Sons Ltd. 2000.
2. JEFFREY H.REED, "Software Radio: A Modern Approach to radio engineering" Reprint by Pearson Education & Inc. 2002.

Reference Books:

1. Essentials of Cognitive Radio – Linda E-Doyle CUP – 2009
2. Principles of Cognitive Radio – Ezio Biglieri, Andrea J. Goldsmith, Larry J. Greenstein, Narayana B. Mandayam and H. Vincent Poor – CUP – 2013
3. Dynamics Spectrum access and Management in Cognitive Radio Networks – Ekram Hossain, Dusit Niyato, Zhu Han, CUP -