

Kadi Sarva Vishwavidyalaya
Master of Computer Application (MCA)
Year – II (Semester – IV) (W.E.F. January 2015)
Subject Name: Heterogeneous Network - MCA-406(C)

Sub Total Credit	Teaching scheme		Examination scheme				Total Marks
	(per week)		MID	CEC	External		
	Th	Pr	Th	Th	Th.	Pr.	
3	3	0	25	25	50	0	100

Course Objectives:

The objective of this course is based on understanding Overview, Technology , Management and Application of Heterogeneous networks . It covers theoretical as well as applied aspects of Heterogeneous Network and analyzes a number of working systems (case studies).

Pre-requisites:

- Knowledge of Wireless networks, Protocols, Transmission Media
- Knowledge of Computer Network Operating Systems

Detailed Syllabus

Unit-1 Introduction and overview of Heterogeneous Networks

20%

- Motivations for Heterogeneous Networks
- Definitions of Heterogeneous Networks
- Heterogeneous Networks Use Scenarios
- Aspects of Heterogeneous Network Technology
 - RF Interference
 - Radio System Configuration
 - Network Coupling
 - User and Device Credential
 - Interworking
 - Handover
 - Data Routing
 - Quality of Service
 - Security and Privacy
 - Capacity and Performance Evaluation
- Heterogeneous cellular network nodes
 - Remote radio heads
 - Micro base stations
 - Pico base stations
 - Femoto cell access points
 - Relay nodes
- Introduction to 3GPP LTE advanced heterogeneous cellular networks.

Unit-2 Multi-tier Network Architecture

20%

- Heterogeneous Network Deployment Scenarios.
 - OSG scenario
 - CSG scenario
- Interference Management
- Multi-radio techniques

- Cross-tier interference
- Deployment Scenarios for LTE-Advanced HetNet
 - Macro-Femto Scenario
 - Macro-Pico Scenario.

Unit-3 Inter-cell interference Management 20%

- Introduction
- Conventional inter-cell interference Coordination
- Enhanced inter-cell Interference Coordination
- Interference Scenarios

Unit-4 Mobility and handover management 20%

- Mobility Management in RRC-connected state.
- Mobility Management in RRC-idle state
- Mobility Management in heterogeneous cellular networks.

Unit-5 Cell Selection Modes in Heterogeneous Deployment 20%

- Distinction of cells
- Access Control
 - Access Control Scenarios
 - Access Control Executor
 - Access Control Mechanism
- Cell Selection and Cell Reselection.
- Cell Reselection in Macro-Femto cells.

Reference Books:

1. Heterogeneous Cellular Networks. – Rose Qing Hu, Yi Qian – Wiley Publication, IEE Press
2. Heterogeneous Cellular Networks – Theory, Simulation and Deployment, By: Xiaoli Chu, David Lopez-Perez, Yang Yang, Fedrik Gunnarsson - Cambridge University Press.
3. Heterogeneous Wireless Access Networks – Ekram Hossain – Springer.