KOENIG SOLUTIONS · COURSE OUTLINE

Wireless Networks Resource Management

Learn to manage power, spectrum, QoS and cross-layer resources in wireless networks, including network slicing and cloud-based architectures.

5	21	6
MODULES	TOPICS	HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers resource management architectures, protocols, techniques and algorithms for wireless networks, including power management. It then addresses spectrum management, covering allocation, sharing, leasing, dynamic spectrum access, spectrum auctions and interference management. Quality of Service management is examined through QoS requirements, architectures, protocols, admission control, scheduling, resource reservation and multimedia applications, followed by cross-layer resource management combining power, spectrum and QoS optimisation. The course concludes with network slicing, resource allocation techniques, cloud-based wireless networks, and evaluating load balancing and QoS performance.

WHO THIS COURSE IS FOR

- **Network Engineers**
- **Wireless Network Architects**
- **Telecom Engineers**
- **RF Engineers**
- **Network Planners**

LEARNING OBJECTIVES

- Explain wireless resource management architecture and protocols
- Apply power management techniques in wireless networks
- Describe spectrum allocation, sharing and leasing methods
- Implement dynamic spectrum access using cognitive radio and sensing
- Apply interference management techniques in wireless networks
- Configure QoS techniques such as admission control and scheduling
- Implement cross-layer power and spectrum optimisation
- Evaluate load balancing and QoS performance in network slicing

COURSE SYLLABUS

5 Modules, 21 Topics

01

Hands-on Lab

Introduction to Wireless Networks Resource Management

TOPICS

- Introduction to wireless networks resource management
- Wireless resource management architecture and protocols
- Wireless resource management techniques and algorithms
- Power management in wireless networks

02

Hands-on Lab

Spectrum Management in Wireless Networks

TOPICS

- **Spectrum management in wireless networks:** spectrum allocation, sharing, and leasing
- **Dynamic spectrum access techniques:** cognitive radio and spectrum sensing
- Spectrum auctions and trading in wireless networks
- Interference management techniques in wireless networks

03

Hands-on Lab

Quality of Service (QoS) Management in Wireless Networks

TOPICS

- **Quality of Service (QoS) in wireless networks:** QoS requirements, metrics, and parameters
- QoS architectures and protocols in wireless networks
- **QoS management techniques in wireless networks:** admission control, scheduling, and resource reservation
- QoS management for multimedia applications in wireless networks

04

Hands-on Lab

Cross-Layer Resource Management in Wireless Networks

TOPICS

- Cross-layer resource management in wireless networks
- Joint optimization of power and spectrum management in wireless networks
- Cross-layer QoS management in wireless networks
- Cross-layer resource management for multimedia applications in wireless networks

05

2 Practical Exercises

Introduction to Network Slicing in Wireless Networks

TOPICS

- Resource allocation techniques for network slicing
- Introduction to cloud-based wireless networks
- Resource management in cloud-based wireless networks
- Evaluating the performance of the load balancing algorithm
- Evaluating the impact of QoS management on network performance

HANDS-ON ACTIVITIES

Practise What You Learn

#	MODULE	ACTIVITY
01	**Introduction to Wireless Networks Resource Management**	**Hands-on Lab:** Implementing power management techniques using open source tools
02	**Spectrum Management in Wireless Networks**	**Hands-on Lab:** Implementing interference management techniques using open source tools
03	**Quality of Service (QoS) Management in Wireless Networks**	**Hands-on Lab:** Implementing QoS management techniques using open source tools
04	**Cross-Layer Resource Management in Wireless Networks**	**Hands-on Lab:** Implementing cross-layer resource management techniques using open source tools
05	**Introduction to Network Slicing in Wireless Networks**	PRACTICAL EXERCISE - Implementing a load balancing algorithm for a wireless network - Configuring QoS parameters in a wireless network

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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