BLACKBIRD FOR TRAINING

Telecommunication System Engineering

7 – 18 December 2026
Barcelona (Spain)

UK Traininig
PARTNER



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Introduction

The Telecommunication System Engineering course provides a comprehensive and technical understanding of the principles and modern technologies in the field of telecommunications technology. This course aims to equip participants with the knowledge and skills necessary to design, operate, and maintain telecommunication systems effectively and efficiently. The course is ideal for engineers looking to deepen their expertise in telecom systems design, advanced telecommunication technologies, and telecommunication network security. With the rapidly evolving landscape of telecommunication networks, this course serves as a foundation for those aiming to work with both basic and advanced telecom systems.

Whether you're interested in the fundamentals of telecommunication engineering or seeking advanced insights into networking telecommunication technology, this course will provide valuable expertise. The course is designed for professionals who wish to gain the necessary skills to excel in telecommunication engineering, while also exploring telecommunication network definition, and telecommunication technology.

Course Objectives

- Understand the basics of telecommunication networks: Get an overview of basic telecommunication network concepts, including the fundamentals of telephony and digital transmission systems.
- Design and develop telecommunication systems: Learn how to design and implement telecom systems, focusing on advanced telecommunication technologies and digital switching.
- Manage telecommunication network security: Understand the role of telecommunication network security in protecting data and ensuring network stability.
- Master key skills for telecommunications engineers: Develop essential skills for telecommunication engineers, such as network management, data communication, and troubleshooting.
- Explore the future of telecom systems: Gain insights into telecommunication technology innovations, including the role of Voice over IP VoIP and Virtual Private Networks VPNs in modern telecom infrastructure.



Course Outlines

Day 1: Basic Telephony

- Understanding simple telephone connections and the basics of telecommunication technology.
- Exploring telephone networks terminology and principles.
- Overview of traffic engineering and its role in network design.
- Key components of basic telecommunication networks and network configurations.
- Quality of service in telecommunication networks.

Day 2: Switching in an Analog Environment

- Exploring the principles of numbering and its relevance in telecom system design.
- Understanding concentration and expansion in switching systems.
- Introduction to crossbar switches and system control.
- Techniques for measuring telephone traffic and observing dial-service functionality.

Day 3: Introduction to Transmission for Telephony

- Basic principles of telecommunications transmission.
- The three primary impairments to the voice channel and how to mitigate them.
- The role of multiplexing in enhancing transmission capacity.
- Understanding noise measurement units and signal quality in telecommunication technology.

Day 4: The Design of Long-Distance Links

- Key concepts for designing long-distance telecom links.
- Introduction to radio transmission and line-of-sight microwave systems.
- The role of satellite communications and fiber-optic links in modern telecommunication networks.

Day 5: Digital Transmission Systems

- Digital vs. analog transmission: Understanding the shift towards digital transmission systems.
- The fundamentals of Pulse-Code Modulation PCM and its importance in digital telecom networks.
- How regenerative repeaters improve signal strength in long-distance communications.
- Overview of SONET and SDH in modern telecom infrastructure.

Day 6: Digital Switching and Networks

- A comparison of PCM switching and analog switching.
- Techniques for digital switching and managing digital networks.
- Exploring the advantages of digital switching in terms of reliability and scalability.



Day 7: Introduction to Data Communications

- Understanding the fundamentals of data communications in telecom systems.
- Key binary coding conventions and error detection in data transmission.
- The role of the physical layer in data transmission.
- Addressing issues related to digital transmission over analog channels.

Day 8: Data Networks Part 1

- Initial Applications of Data Network Design:
  - Understanding the priorities of a network, such as providing connectivity between geographically dispersed devices.
  - Identifying types of networks Local Area Networks, Wide Area Networks, etc..
- Designing Networks with Focus on Data Terminals, Workstations, and Servers:
  - Studying how to design networks to connect data terminals and workstations.
  - The role of servers in facilitating access to and distribution of data across the network.
- Network Topologies in Data Networks:
  - Understanding various network topologies like star, ring, and mesh.
  - Analyzing the impact of each topology on network performance and flexibility.

Day 9: Data Networks Part 2

- Managing Data Across Networks:
  - Techniques for managing data flow and ensuring data integrity across networks.
  - Monitoring and analysis tools to ensure network stability and efficient data transfer.
- Packet-Switched Networks and the Importance of Packet Switching:
  - Defining packet-switched networks and how they break data into smaller packets for more efficient transmission.
  - Advantages of packet switching in improving efficiency and reducing delays in communication.
- Protocols in Networks such as X.25 and TCP/IP:
  - Explaining the X.25 protocol and its role in older networks.
  - An introduction to the TCP/IP protocol suite, the backbone of the Internet, and how it enables data transmission between different devices.



Day 10: Network Management

- Understanding network management and its key areas: fault, configuration, performance, security, and accounting.
- Telecommunication management network TMN and its role in enterprise telecom networks.
- Techniques for improving network security and survivability in modern telecom infrastructures.

Why Attend this Course: Wins & Losses!

Attending the Telecommunication System Engineering course equips participants with invaluable skills and insights that will:

- Enhance your expertise in telecommunication system design, enabling you to develop and maintain state-of-the-art telecommunication networks.
- Master the latest networking telecommunication technology and gain a competitive edge in the rapidly evolving telecom industry.
- Understand the intricacies of telecommunication network security, and develop strategies to protect and optimize telecom systems.
- Acquire critical skills for telecommunications engineers, such as designing advanced telecom systems, managing data networks, and ensuring system reliability.
- Learn how to address the challenges of advanced telecommunication technologies, ensuring that you can stay ahead of the curve in telecom system innovation.
- Understand the vital concepts of telecommunication technology, digital transmission, and data networks, and how they impact your organization's telecom infrastructure.

By completing this course, you'll be equipped to take on advanced telecom systems and make significant contributions to the future of telecommunication engineering.

Conclusion

If you're looking to advance your career in telecommunication engineering or improve your skills for telecommunication engineers, this course is an essential step. It provides both theoretical insights and practical skills in telecommunication technology, networking telecommunication technology, and telecommunication system design. Whether you're new to the field or aiming to deepen your understanding of advanced telecom systems, this course will enhance your knowledge and set you on the path to becoming a highly skilled telecommunications engineer.

Enroll today and take the first step towards mastering telecommunication engineering and leading the future of telecommunications networks!

