

Advance Satellite Communication Systems

Berlin (Germany)

5 - 2025 May 2025

UK Traininig

PARTNER



Advance Satellite Communication Systems

Code: GC28 From: 5 - 2025 May 2025 City: Berlin (Germany) Fees: 4700 Pound

Introduction

In an era of rapid technological advancement, the realm of satellite communication systems stands at the forefront of innovation. This comprehensive course delves into the cutting-edge technologies and methodologies driving the evolution of advanced satellite communication systems. Participants will embark on a journey through the latest developments in satellite design, communication protocols, signal processing, and network architectures. Through a blend of theoretical insights and practical applications, this course is designed to equip professionals with the knowledge and skills necessary to navigate the complexities of modern satellite communication systems.

Objectives

- Gain a comprehensive understanding of the fundamental principles and concepts underlying advanced satellite communication systems.
- Explore the latest advancements in satellite technology, including next-generation satellite design, propulsion systems, and power management.
- Learn about advanced communication protocols and modulation techniques used in satellite communication systems.
- Understand the principles of satellite signal processing, including error correction coding and modulation schemes.
- Explore the design and implementation of satellite networks, including inter-satellite links and ground station configurations.
- Develop proficiency in analyzing and troubleshooting complex satellite communication systems.

Course Outline

Day 1

Fundamentals of Satellite Communication Systems

- Introduction to satellite communication: history, evolution, and significance.
- Basics of satellite orbits and constellations.
- Satellite subsystems: payload, propulsion, power, and attitude control.
- Overview of satellite link budget analysis.

Day 2

Advanced Satellite Technologies



- Next-generation satellite design: miniaturization, modularization, and reconfigurability.
- Advanced propulsion systems for satellite maneuverability and orbit control.
- Power generation and management in space.
- Satellite antennas: types, characteristics, and deployment considerations.

Day 3

Communication Protocols and Modulation Techniques

- Overview of communication protocols in satellite systems: TDMA, CDMA, FDMA.
- Advanced modulation techniques: QPSK, 8PSK, QAM.
- Forward Error Correction FEC coding for error detection and correction.
- Adaptive coding and modulation ACM for dynamic link adaptation.

Day 4

Satellite Signal Processing

- Satellite signal propagation: path loss, atmospheric effects, and noise.
- Digital modulation and demodulation techniques.
- Error correction coding: convolutional codes, Reed-Solomon codes, turbo codes.
- Carrier recovery and synchronization in satellite communication.

Day 5

Satellite Networks and System Integration

- Design principles of satellite networks: GEO, MEO, and LEO constellations.
- Inter-satellite links ISLs and satellite-ground station communication.
- Ground station configuration and operation.
- Case studies and practical exercises in satellite system design and optimization.

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International House 185 Tower Bridge
Road London SE1 2UF United Kingdom



+44 7401 1773 35
+44 7480 775526



training@blackbird-training.com



www.blackbird-training.com

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