5GCOPS - OPERATIONALIZING CISCO 5G SOLUTIONS

Course Code: 821402

This course addresses 5G technologies and includes the latest research and industry techniques needed to give you the necessary resources, tools and pointers to build and operate 5G networks that organizations are looking for.

5G, the newest 5th generation mobile wireless broadband technology is based on the IEEE 802.11ac standard. In 2021, organizations looking to deploy their 5G vision immediately realize that they will need to master many new technologies. This course addresses those technologies and includes the latest research and industry techniques needed to give you the necessary resources, tools, and pointers to build and operate 5G networks that organizations are looking for.

5G is quite different from 4G and it is necessary to understand the underlying 5G cloud-native technologies to fully embrace and understand 5G. This course starts from the basics by introducing the motivation for 5G, its enabling technologies including fundamental cloud-native principles and then builds on top of these concepts as we explore the 5G Core concepts in depth.

4G is going to be around for quite a while and both 4G and 5G networks will need to co-exist for many years. This course covers practical deployment considerations for such 4G/5G co-existence scenarios as well.

What You'll Learn

What the Student will learn.

- How to apply key 5G New Radio technologies using an array of Cisco 5G devices and software services to include Ultra Cloud Core microservices architecture
- Standardization of 5G
- 5G Use Cases-Enhanced Mobile Broadband, Massive Machine Type Communication, URLLC
- 5G Deployment Options-Standalone Vs Non-Standalone Architectures
- Dual Connectivity in 5G Networks
- Small Cells with Dual Connectivity in 5G Technology
- 5G Frequency Spectrum in 5G Networks

- Flexible Numerology and Frame Structure
- 5G Cloud Radio Access Network (CRAN)
- Massive MIMO AND beam-forming in 5G
- 5G Access Network Architecture
- 5G Core Network Architecture
- Network Function Virtualization
- Network Slicing
- UE Identifiers-PEI, SUPI, SUCI, 5G-S-TMSI, 5G-GUTI
- Tracking Areas in 5G
- 5G Network Identifiers
- 5G Network Procedures
- Cisco Device and Software Deployment option in the 5G Ecosystem
- Backwards Compatibility to 4G
- Alternate Technology Options like WI-FI 6
- Principles, Architecture and Operations of OpenRoaming
- How Open Roaming leverages the best of both 5G and WI-FI 6

Who Needs to Attend

Target Audience:

- System Engineers
- System Administrators
- System Architects
- Channel Partners
- Technical Decision Makers

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VIRTUAL CLASSROOM LIVE	$4,495 USD	5 Day

Virtual Classroom Live Outline

Module 1: Introduction

- Standardization of 5G-Evolution from 1G to 5G
- ITU-R Vision for 5G
- Use Case-Enhanced Mobile Broadband Vs Standalone Architectures

Module 2: Moving from 4G to 5G-None-standalone vs Standalone Architectures.

- Introduction to 5G Architecture
- 5G Deployment Options-Standalone vs Non-Standalone Architectures

Module 3: Massive MIMO and Beam-forming in 5G

- Introduction
- Antennas For mmWave
- How 3D Beamforming Works
- 5G Antennas for massive MIMO

Module 4: Key Technologies of 5G New Radio (NR)

- Dual Connectivity in 5G Networks
- Small Cells with Dual Connectivity in 5G
- Increased Wireless Spectrum of 5G And Its Properties
- OFDMA, Flexible Numerology and Frame Structure in 5G
- Resource Block and Resource Element
- 256 QAM As Modulation Technique In 5G Networks
- Cloud Radio Access Network (CRAN) in 5G Networks

Module 5: 5G Network Architecture-Core Network

- Access and Mobility Management Functions (AMF)
- Authentication Server Function (AUSF)
- Session Management Function (SMF)

- User Plane Function (UPF)
- Unified Data Management (UDM)
- Policy Charging Function (PCF)
- Application Function (AF)

Module 6: Remaining Function of 5G Core Network

- Network Repository Function (NRF)
- Network Slice Selection Function (NSSF)
- Network Exposure Function (NEF)

Module 7: Network Function Virtualization and Network Slicing

- Network Function Virtualization (NFV)
- Network Slicing

Module 8: Identifiers in 5G

- UE Identifiers-PEI, SUPI, SUCI, 5G-S-TMSI, 5G-GUTI
- Tracking Areas in 5G
- 5G Network Identifiers

Module 9: Network Architecture

- Next Generation NodeB (gNB) functions in NG-RAN
- Packet Data Unit (PDU) session
- What is Meant by Control Plane and User Plane separation?

Module 10: Procedures in 5G Networks

- UE Power-On and Registration
- UE Idle and Connected Modes
- PDU Session Establishment
- UE Paging Procedure
- Tracking Area Update procedures
- Handover and Its Types In 5G

Module 11: Transport Architectures for 5G RAN

- Location Flexibility
- Mapping 5G RAN to Transport Networks
    - Service Layer
    - Mobile Network
        - RU
        - DU
        - CU
        - 5GC
        - Front-haul, mid-haul, back-haul
    - Fixed Transport Network
- Mapping Functional Nodes to the Physical Network
- Time Sensitive Networking

Module 12: Interworking with 4G

- Cisco core network solution evolution
- Voice and IMS options in 5G SA

- EPC vs 5GC

Module 13: Cisco's Cloud based approach to 5G

- 5G converged SDN transport Architecture
- Segment routing
- Cloud RAN
- Service Provider Automation portfolio
- Security First mobile transport
- Open vRAN
- Multi-Access Edge Computing (MEC)
- Cisco Ultra Service Platform

Module 14: WI-FI 6

- What is WI-FI 6?
- How does WI-FI 6 differ from 802.11ax
- Components of WI-FI 6
    - Denser modulation using 1024 Quadrature Amplitude Modulation (QAM)
    - Orthogonal Frequency Division Multiple Access (OFDMA)-based scheduling to reduce overhead and latency.
    - Robust high efficiency signaling for better operation at a significantly lower Received Signal Strength Indication (RSSI).
    - Better scheduling and longer device battery life with Target Wake Time (TWT)

Module 15: 5G and WI-FI 6 Co-existing

- Cisco Open Roaming
- The New Standard
- Open Roaming Technology Pillars
    - Passpoint
    - WRIX
    - HSP Network Endpoints
- Open Roaming Network Deployment Architecture
- RCOI and Policy Implementation
- QoS Types and Service Level
    - Baseline QoS
    - Silver QoS
    - Gold QoS
- RadSec Secured Interconnect
- Dynamic Discover of HSPs/IDPs

Module 16: vRAN, Cloud RAN and Open RAN

Module 17: Network Slicing in 5G

Module 18: MEC Architecture and Operations

Module 19: Advanced 5G NR AirInterface Operations

Module 20: 5G QoS Operations

Sep 22 - 25, 2025 | 10:00 AM - 6:00 PM EST

Nov 17 - 21, 2025 | 10:00 AM - 6:00 PM EST

Visit us at www.globalknowledge.com or call us at 1-866-716-6688.

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