



5G Essentials

- 3 Day Course
- Hands-on and Lecture

Course Overview

This course features a mixture of lecture and hands-on training, making it possible to understand essential 5G concepts by allowing you to work directly with your own 5G network. You will follow a step by step approach to analyze the key components in a working 5G network. You will work directly with the UE, RAN and core services. You will perform basic call flow analysis through demonstration and optional wireshark downloads. A hands-on approach to learning 5G is the best way to learn this new technology! When you successfully complete this course, you will possess a well rounded, vendor neutral, understanding of key components within the 5G network architecture and become fully empowered to take an active role in working with your 5G engineers. If you are an engineer and need a complete understanding of the 5G network, then strongly consider following up with an additional 2-Days of Deploying 5G.

Review this course online at https://www.alta3.com/courses/5g

Who Should Attend

- Professionals planning to use 5G Access
- Professionals looking to merge 5G and Wifi6 radio technology

What You'll Learn

- 5G EN-DC architecture
- 5G Stand alone architecture
- Beamforming, mm-wave, massive-mimo
- 5G Access technology, O-RAN, and v-RAN
- New Radio technology, numerology
- Narrowband IoT support technology
- IMS in the 5G Network
- Network Slicing
- 5G call trace analysis

Outline

5G Overview

- 💭 Lecture: The Generations
- \blacksquare Lecture: Service Types
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 ${\ensuremath{\overline{\ominus}}}$ Lecture: New Radio
- ${\ensuremath{\overline{\ominus}}}$ Lecture: Slicing and 5G Edge

5G Stand Alone

- 💭 Lecture: 5G SA
- 🖳 Lecture + Lab: Start the 5G core

- \Box Lecture + Lab: Start the gNB RAN
- 🖳 Lecture + Lab: Start Web Console

Adding Subscribers

- 🖳 Lecture + Lab: Configuring the UE SIM Card
- 🖳 Lecture + Lab: UE 5G Core Configuration
- \blacksquare Lecture + Lab: Start UE plus Network Slicing Analysis
- 🖳 Lecture + Lab: Analyzing UE Status

Understanding Mobility

- \blacksquare Lecture: Introduction to mobility
- 🗐 Lecture: Registration Areas
- 💭 Lecture: 5G Handoff
- 🖳 Lecture + Lab: Show Tracking areas

AI and ML in 5G

- 🗐 Lecture: NWDAF Introduction
- 🗐 Lecture: NWDAF Use Cases

Understanding the RAN

- ${\ensuremath{\fbox{P}}}$ Lecture: Introduction to New Radio
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 ${\ensuremath{\overline{\ominus}}}$ Lecture: The New Radio Stack
- \blacksquare Lecture: EN-DC RAN
- 🖳 Lecture + Lab: WORKSHEET EN-DC
- 🗐 Lecture: O-RAN
- \Box , Lecture + Lab: WORKSHEET RAN
- 🖳 Lecture + Lab: show gnb configuration

Analyze the gNB RAN

• 🖳 Lecture + Lab: Analyzing gNB Status

The IP Multimedia Subsystem

- 🗐 Lecture: IMS
- 🖳 Lecture + Lab: WORKSHEET IMS

5G SA Microservices

- 🗐 Lecture: AMF
- \Box , Lecture + Lab: show AMF configuration
- 🗐 Lecture: NRF
- \Box , Lecture + Lab: show NRF configuration
- 🗐 Lecture: UDM
- **<u>L</u>** Lecture + Lab: show UDM configuration
- 🗐 Lecture: UDR
- \Box , Lecture + Lab: show UDR configuration
- \blacksquare Lecture: AUSF, SUPI and SUCI
- \blacksquare Lecture + Lab: show AUSF configuration
- 🕮 Lecture: PCF
- \blacksquare Lecture + Lab: show PCF configuration
- 💭 Lecture: SMF

- \blacksquare Lecture + Lab: show SMF configuration
- \blacksquare Lecture + Lab: show UPF configuration
- \blacksquare Lecture + Lab: WORKSHEET Stand Alone

5G Stacks

- 🗐 Lecture: 5G Stacks
- 🖳 Lecture + Lab: How to capture 5G traffic
- \Box Lecture + Lab: Termshark http2
- \Box Lecture + Lab: Termshark 5G-NAS
- 🖳 Lecture + Lab: Termshark NGAP

5G Infrastructure

• 🕮 Lecture: Infrastucture

Slicing

- 💭 Lecture: Slicing
- 🗐 Lecture: Practical Slicing example
- \blacksquare Lecture: NSSF
- \blacksquare Lecture + Lab: show NSSF configuration

Sharing Spectrum

- 💭 Lecture: Unlicensed Spectrum
- ${\ensuremath{\overline{\ominus}}}$ Lecture: US Unlicensed Spectrum
- 🗐 Lecture: MOCN

The 5G Edge

• \blacksquare Lecture: MEC

5G Call flow review and analysis

- 🗐 Lecture: Lecture-LAB 5G Reg Capture
- \blacksquare Lecture: Lecture-LAB 5G Reg Analysis
- 🖳 Lecture + Lab: 5G PDU Session Capture
- \blacksquare Lecture: Lecture-LAB 5G PDU Session

Next Courses

• Deploying 5G (https://alta3.com/courses/5g-deploy)