

## Wireless Fundamentals 1 (WFUN1)

**ID** WFUN1 **Price** 2,290.— €(excl. tax) **Duration** 3 days

This course can be booked in combination with the [Wireless Fundamentals 2 \(WFUN2\)](#) as package [Wireless Fundamentals Complete Package \(WFUNP\)](#).

### Who should attend

- IT staff
- Network engineers
- Technicians/Electrical engineers
- Administrators

### Prerequisites

- Basic knowledge of network protocols and wireless LAN are advantageous, but not mandatory
- Contents of the course [Networking & TCP/IP Fundamentals \(NWF\)](#)

### Course Objectives

In our seminar, we will teach you the fundamentals of radio engineering and wireless technologies.

In addition, topics such as antennas, modulation, standards, media access methods, regulations, mobility, interference source detection, strategies for planning, building and operating small to large enterprise solutions will be covered.

Theory is accompanied with extensive hands-on assignments and examples from real-world networks, as well as live demos from our WiFi experts. The course offers a vendor-independent introduction to wireless technologies and provides all the basic knowledge required for vendor-specific courses such as [Understanding Cisco Wireless Foundations \(WLFNDU\)](#).

### Course Content

#### Fundamentals of 802.11

- 802.11 and WiFi standards
- Wireless regulations and country codes
- 802.11b
- 802.11a
- 802.11g
- 802.11n
- 802.11ac
- 802.11ax
- Next Generation 802.11 Standards
- Wireless Modulation and MCS

### Wireless planning and coverage

- Planning parameters for WLAN transmission
- Internal and external antennas
- Illumination measurement and simulation techniques
- 2.4GHz and 5GHz
- Capacity-oriented WLAN planning
- Coverage and mobility
- Capacity-oriented planning

### Different WLAN solutions

- Autonomous access points
- Controller-based WLAN design: architectures, protocols, vendor concepts
- Cloud-based WLAN design: special features, pros/cons, vendor concepts
- Integration of WLAN in modern layer-3-based LAN infrastructures
- Mesh networks and IEEE 802.11s: design, application areas
- Virtual controllers
- Instant Access Points

### Wireless LAN management

- Monitoring of the wireless interface: coverage, data rates, throughput and utilization of access points
- Detection of end device mobility
- Malfunctions and interference: Detection and countermeasures
- WLAN, Bluetooth and Zigbee
- Simple tools for daily use for smartphones and notebooks

### Measurement technology for wireless LAN

- Typical measurement and analysis tasks in WLAN
- Categories of WLAN measurement technology
- WiFi spectrum analyzer

### WLAN Security Basics

- Authentication
- Authorization
- Encryption
- WPA/WPA2/WPA3
- 802.11i
- Guest Portals and Web Authentication
- 802.1X/Radius/PKI concepts

### Labs and demos

- Installation of Cisco Wireless LAN Controllers and Access Points
- Installation of Aruba Wireless LAN Controllers and Access Points
- Demo Cisco C9800 WLC and 91XX Access Points
- Demo Cisco Prime Infrastructure
- Demo Ekahau WiFi Planning

### Detailed Course Outline

#### Fundamentals of 802.11

- 802.11 and WiFi standards
- Wireless regulations and country codes
- 802.11b
- 802.11a
- 802.11g
- 802.11n
- 802.11ac
- 802.11ax
- Next Generation 802.11 Standards
- Wireless Modulation and MCS

#### Wireless planning and coverage

- Planning parameters for WLAN transmission
- Internal and external antennas
- Illumination measurement and simulation techniques
- 2.4GHz and 5GHz
- Capacity-oriented WLAN planning
- Coverage and mobility
- Capacity-oriented planning

#### Different WLAN solutions

- Autonomous access points
- Controller-based WLAN design: architectures, protocols,

vendor concepts

- Cloud-based WLAN design: special features, pros/cons, vendor concepts
- Integration of WLAN in modern layer-3-based LAN infrastructures
- Mesh networks and IEEE 802.11s: design, application areas
- Virtual controllers
- Instant Access Points

### Wireless LAN management

- Monitoring of the wireless interface: coverage, data rates, throughput and utilization of access points
- Detection of end device mobility
- Malfunctions and interference: Detection and countermeasures
- WLAN, Bluetooth and Zigbee
- Simple tools for daily use for smartphones and notebooks

### Measurement technology for wireless LAN

- Typical measurement and analysis tasks in WLAN
- Categories of WLAN measurement technology
- WiFi spectrum analyzer

### WLAN Security Basics

- Authentication
- Authorization
- Encryption
- WPA/WPA2/WPA3
- 802.11i
- Guest Portals and Web Authentication
- 802.1X/Radius/PKI concepts

### Labs and demos

- Installation of Cisco Wireless LAN Controllers and Access Points
- Installation of Aruba Wireless LAN Controllers and Access Points
- Demo Cisco C9800 WLC and 91XX Access Points
- Demo Cisco Prime Infrastructure
- Demo Ekahau WiFi Planning

# About Fast Lane



Fast Lane is a global, award-winning specialist in technology and business training as well as consulting services for digital transformation. As the only global partner of the three cloud hyperscalers- Microsoft, AWS and Google- and partner of 30 other leading IT vendors, Fast Lane offers qualification solutions and professional services that can be scaled as needed. More than 4,000 experienced Fast Lane professionals train and advise customers in organizations of all sizes in 90 countries worldwide in the areas of cloud, artificial intelligence, cyber security, software development, wireless and mobility, modern workplace, as well as management and leadership skills, IT and project management.

## Fast Lane Services

- ✓ High End Technology Training
- ✓ Business & Soft Skill Training
- ✓ Consulting Services
- ✓ Managed Training Services
- ✓ Digital Learning Solutions
- ✓ Content Development
- ✓ Remote Labs
- ✓ Talent Programs
- ✓ Event Management Services

## Training Methods

- ✓ Classroom Training
- ✓ Instructor-Led Online Training
- ✓ FLEX Classroom – Classroom & Online Hybrid
- ✓ Onsite & Customized Training
- ✓ E-Learning
- ✓ Blended & Hybrid Learning
- ✓ Mobile Learning

## Technologies & Solutions

- ✓ Digital Transformation
- ✓ Artificial Intelligence
- ✓ Cloud
- ✓ Networking
- ✓ Cyber Security
- ✓ Wireless & Mobility
- ✓ Modern Workplace
- ✓ Data Center



**Worldwide Presence**  
with high-end training centers  
around the globe



**Multiple Awards**  
from vendors such as AWS,  
Microsoft, Cisco, Google, NetApp,  
VMware



**Experienced SMEs**  
with over 19.000 combined  
certifications

### Germany

**Fast Lane Institute for Knowledge  
Transfer GmbH**  
Tel. +49 40 25334610  
[info@flane.de](mailto:info@flane.de) / [www.flane.de](http://www.flane.de)

### Austria

**ITLS GmbH**  
(Partner of Fast Lane)  
Tel. +43 1 6000 8800  
[info@itls.at](mailto:info@itls.at) / [www.itls.at](http://www.itls.at)

### Switzerland

**Fast Lane Institute for Knowledge  
Transfer (Switzerland) AG**  
Tel. +41 44 8325080  
[info@flane.ch](mailto:info@flane.ch) / [www.flane.ch](http://www.flane.ch)