MOBILITY FRIENDS TRAINING CENTER • COURSE PROGRAM

STEM AND TECHNOLOGICAL INNOVATION

Technology, Robotics and Engineering

NETWORK SYSTEMS: DESIGN, CONFIGURATION AND MANAGEMENT

Your Mobility Partner

PIC Number: 948037649 | **Organisation ID:** E10207576

COURSE OVERVIEW

Network Systems: Essentials of Design, Installation and Management offers a practical and accessible introduction to the world of computer networking. Through a combination of interactive sessions, hands-on labs, and real-world scenarios, participants will explore the core principles, standards, and technologies that underpin modern network infrastructures. The course covers essential topics such as Ethernet and structured cabling, IP addressing, network design, installation and configuration, wireless technologies, and network management. Learners will develop the technical skills needed to plan, build, and maintain robust and secure network environments, while gaining valuable experience in troubleshooting and optimisation. By the end of the course, participants will have the confidence and knowledge to support network projects in a variety of contexts and be prepared for further study or professional development in the field.

TARGET AUDIENCE

This course is intended for participants who wish to develop a solid understanding of computer network systems, from fundamental concepts to practical implementation. It is suitable for anyone interested in learning how to design, install, configure, and manage modern network infrastructures. The course provides a practical introduction to networking for those seeking to expand their technical knowledge, improve professional skills, or gain confidence in working with network technologies.

REQUIREMENTS

To take part in the course, participants must meet the following requirements:

- Have at least a B1 level of English (independent user);
- Complete and submit the registration form before the start of the training;
- Bring a laptop or tablet to use during the sessions;
- Commit to active participation and attend at least 80% of the course.

COURSE OBJECTIVES

The objectives of the course are:

- Understand the fundamental concepts and standards of computer networks and communications.
- Identify and select appropriate network components and technologies for different scenarios.
- Design, assemble, and configure both wired and wireless network infrastructures.
- Apply best practices in structured cabling, equipment installation, and network organisation.
- Assign and manage IP addresses and related network services.
- Install, configure, and secure network devices such as switches, routers, and access points.
- Troubleshoot and resolve common network issues effectively.
- Evaluate and optimise the performance and security of network systems.
- Document network configurations and procedures for future reference and maintenance.

CONTACTS AND REGISTRATION

For registrations, additional information, or budget requests, please contact our team by email at trainingcourses@mobilityfriends.org or visit our website at www.mobilityfriends.org .

LEARNING OUTCOMES

Upon successful completion of this course, learners will be able to:

1. Explain the key principles, standards, and terminology used in computer networking.
2. Distinguish between different types of network topologies, devices, and cabling systems.
3. Design and document basic network diagrams for various environments.
4. Assemble, test, and organise structured cabling following industry standards.
5. Assign, configure, and troubleshoot IP addresses and related services (DHCP, DNS).
6. Install and configure essential network equipment such as switches, routers, and wireless access points.
7. Set up and secure both wired and wireless networks.
8. Identify and resolve common connectivity and performance issues using appropriate tools.
9. Apply basic network security measures to protect data and systems.
10. Maintain clear documentation of network configurations, changes, and maintenance procedures.

METHODOLOGY

The course is structured around a rigorous methodology that combines theoretical exposition, practical work, and applied demonstrations. This approach ensures a thorough understanding of the subject matter and its direct application in real-world contexts.

Theoretical sessions provide essential foundations, while practical work and demonstrations facilitate the development of technical skills and familiarity with the specific tools and procedures relevant to the course.

Continuous monitoring through individualized feedback allows for tracking learners' progress and ensures the achievement of the set objectives, preparing participants to face professional challenges with competence and precision.

ASSESSMENT

Assessment is carried out continuously throughout the course, using a holistic and learner-centered approach that reflects both participation and performance. Each participant is evaluated based on their overall engagement, regular attendance, punctuality, interest in the topics covered, ability to apply knowledge during practical tasks, and interaction with peers in individual and group activities.

The evaluation process includes a variety of classroom-based tasks (oral and written), short daily assignments, role-plays, and simulations. Trainers provide ongoing, individualized feedback to support progress and encourage active learning.

A Certificate of Participation is awarded to participants who attend at least 80% of the sessions and demonstrate consistent involvement and commitment during the training.

DURATION

The standard duration of our course is 20 hours (5 days), designed to ensure comprehensive and effective learning. However, this duration can be adjusted, in specific cases, to meet the particular needs of each group, in order to optimize outcomes and better suit the training context.
For further details or to discuss a customized schedule, please get in touch with us.

PRICE AND FUNDING

Each quotation is personalized and depends on several factors, such as the number of participants, the number of training hours, the location of the course, and any additional services requested (accommodation, transport, meals, cultural activities, etc.).
To receive a tailored quotation for your group, please get in touch with us.
The training can be funded through programs such as Erasmus+ (KA1 – Learning Mobility), among other European support mechanisms. For more information about funding, participants should contact their sending organization or their country's National Agency directly.

LOCATION AND COURSE LANGUAGE

We have training rooms in several cities in Mainland Portugal, such as Barcelos (headquarters), Braga, Póvoa de Varzim, and Porto. We also have spaces in the islands of Madeira (Funchal) and the Azores (Ponta Delgada). Additionally, we have facilities in Valencia, Spain.
The course is delivered in English.

CERTIFICATION

A Certificate of Participation is awarded to participants who attend at least 80% of the sessions and demonstrate consistent engagement and commitment throughout the training. Upon completion of the course, a formal certification ceremony will take place, during which the certificates will be presented to the participants.

OTHER SERVICES

To enrich the training experience, Mobility Friends offers a range of additional services, subject to availability and additional cost, which can be arranged for individual participants or groups.
Services include:

- Accommodation in partner residences or hotels
- Meals (lunch and/or dinner)
- Transfers between the accommodation and the training room
- Airport transfers
- Cultural visits

All services are subject to availability and must be requested in advance. For more information and personalised quotes, please contact our team.

COURSE CONTENTS

MODULE 1: ETHERNET STANDARDS AND FUNDAMENTALS

- Introduction to Ethernet technology.
- Ethernet speeds and generations (10/100/1000 Mbps, 10GbE, etc.).
- Cables and connectors: Cat5e, Cat6, Cat6a, fibre optics.
- Ethernet topologies and basic troubleshooting.

MODULE 2: STRUCTURED CABLING STANDARDS AND BEST PRACTICES

- What is structured cabling? Purpose and benefits.
- International standards (ANSI/TIA-568, ISO/IEC 11801).
- Components: cables, patch panels, outlets, racks.
- Planning, installation, labelling, and cable management.
- Practical activity: assembling and testing network cables.

MODULE 3: IP ADDRESSING AND NETWORK SEGMENTATION

- Principles of IPv4 addressing; introduction to IPv6.
- Subnetting and calculating network ranges.
- Public vs. private IP addresses.
- Dynamic (DHCP) and static IP assignment.
- Practical exercises: subnetting and assigning IPs.

MODULE 4: DESIGNING A COMPUTER NETWORK

- Needs assessment and requirements gathering.
- Creating logical and physical network diagrams.
- Selecting network equipment (switches, routers, access points, servers).
- Planning for scalability, security and redundancy.

MODULE 5: INSTALLING THE COMPUTER NETWORK

- Physical installation: laying cables, positioning devices, connecting endpoints.
- Setting up patch panels, racks, and network closets.
- Verifying installation quality: continuity and certification tests.
- Documentation and organisation.

*Please note that program content may be subject to change based on input from our trainers.

COURSE CONTENTS

MODULE 6: NETWORK INFRASTRUCTURE COMPONENTS

- Core devices: switches, routers, wireless access points, firewalls.
- Layer 2 vs. Layer 3 devices; VLANs and segmentation.
- Power and environmental considerations for network equipment.
- Introduction to network monitoring basics.

MODULE 7: INSTALLING AND CONFIGURING A ROUTER

- Router setup: connecting interfaces, assigning IP addresses.
- Static and dynamic routing basics.
- Configuring NAT and firewall rules.
- Port forwarding and remote access.
- Practical configuration exercise.

MODULE 8: WIRELESS TECHNOLOGIES

- Wi-Fi standards (802.11a/b/g/n/ac/ax): capabilities and differences.
- Wireless security: encryption (WPA2, WPA3), authentication.
- Site surveys: planning coverage, avoiding interference.
- Installing and configuring wireless access points.
- Troubleshooting wireless networks.

MODULE 9: NETWORK MANAGEMENT, TROUBLESHOOTING, AND OPTIMIZATION

- Basic network monitoring tools: ping, traceroute, ipconfig, Wireshark.
- Troubleshooting connectivity and performance issues.
- Documentation, change management, and routine maintenance.
- Best practices for network optimisation and reliability.

MODULE 10: FINAL PROJECT AND PRESENTATION

- Design and implementation of a small-scale network scenario (group or individual).
- Configuration, documentation and testing of the setup.
- Presentation and discussion of project results and challenges.
- Feedback from trainers and peers.

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