MOBILITY FRIENDS TRAINING CENTER • COURSE PROGRAM

STEM AND TECHNOLOGICAL INNOVATION

Technology, Robotics and Engineering

COMPUTER NETWORKS AND OPERATING SYSTEMS: FOUNDATIONS AND PRACTICE

Your Mobility Partner

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

COURSE OVERVIEW

Computer Networks and Operating Systems: Foundations and Practice offers a practical introduction to the essential principles and skills required to understand, set up, and manage modern IT environments. Through a balanced combination of theory and hands-on activities, participants will explore how computer networks function and how operating systems—such as Windows and Linux—interact with these networks. The course covers key topics including network design and configuration, structured cabling, IP addressing, installation and management of operating systems, sharing and securing resources, and troubleshooting common issues. By the end of the programme, learners will be able to confidently configure, secure, and support integrated networked systems, preparing them for further study or entry-level roles in IT support and administration.

TARGET AUDIENCE

This course is designed for participants who wish to gain a solid grounding in both computer networks and operating systems, and to understand how these two areas interact in modern IT environments. It is suitable for anyone interested in developing practical skills for configuring, managing, and troubleshooting networked systems, whether for professional growth, academic purposes, or personal interest. The course is ideal for those looking to build confidence and competence in the essential foundations of digital infrastructure.

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, components, and terminology of computer networks and operating systems.
- Recognise how operating systems interact with network environments and support networked communication.
- Acquire practical skills in installing, configuring, and managing both Windows and Linux operating systems in networked contexts.
- Design, implement, and document simple network infrastructures.
- Configure network connections, share resources, and manage users across different operating systems.
- Apply basic security and troubleshooting techniques to maintain reliable and secure networked systems.
- Develop confidence to support, maintain, and optimise IT environments involving both networks and operating systems.

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 basic concepts and terminology of computer networks and operating systems.
2. Identify the main components and topologies of modern computer networks.
3. Install and configure Windows and Linux operating systems for networked environments.
4. Set up and manage network connections, including IP addressing and DNS configuration.
5. Share files, printers, and other resources across different operating systems.
6. Apply basic user and group management in both Windows and Linux.
7. Implement fundamental security practices, such as firewalls and permissions, to protect systems and data.
8. Diagnose and troubleshoot common connectivity and configuration issues.
9. Document network and system setups for future reference and maintenance.
10. Reflect on the integration between operating systems and networks in supporting digital infrastructures.

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: DIGITAL INFRASTRUCTURES - NETWORKS AND OPERATING SYSTEMS IN CONTEXT

- Role and evolution of computer networks and operating systems in modern organisations.
- Interaction between OS and network services.
- Types of networks (LAN, WAN, WLAN, VPN) and common operating systems (Windows, Linux, macOS).
- Real-world examples: how networks and OS work together in business, education, and public services.

MODULE 2: STANDARDS, HARDWARE, AND STRUCTURED CABLING

- OSI and TCP/IP models: layers, functions, and data flow.
- Ethernet standards, Wi-Fi generations, and common protocols.
- Core hardware: NICs, switches, routers, access points, servers.
- Structured cabling principles, best practices, and documentation.
- Hands-on: cable assembly, cable testing, and network map creation.

MODULE 3: ADDRESSING, SEGMENTATION, AND NETWORK CONFIGURATION

- Fundamentals of IPv4 and IPv6 addressing, public/private IPs.
- Subnetting, supernetting, and network segmentation for efficiency and security.
- DHCP and DNS: roles, setup, and troubleshooting.
- Hands-on: configuring static and dynamic IPs in Windows and Linux; verifying and troubleshooting addresses.

MODULE 4: INSTALLING AND MANAGING WINDOWS AND LINUX OPERATING SYSTEMS

- Preparing for OS installation: requirements and partitioning.
- Installing Windows and Linux (demo or guided lab).
- First setup: drivers, system updates, user creation.
- Introduction to the command line: essential commands for networking in both systems.
- Dual boot and virtualisation basics (optional/overview).

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

COURSE CONTENTS

MODULE 5: CONNECTING SYSTEMS AND SHARING RESOURCES

- Connecting devices to wired and wireless networks in different OS.
- File and printer sharing: configuration using SMB/CIFS (Windows) and NFS/Samba (Linux).
- Mapping and accessing shared folders across platforms.
- Permission models and access control.
- Hands-on: setting up a shared folder, configuring access, testing connectivity.

MODULE 6: NETWORK SERVICES AND ADMINISTRATION

- Installing and configuring DHCP, DNS, and basic web services.
- Setting up and managing remote desktop and remote access.
- Monitoring services and network activity (Task Manager, Resource Monitor, Linux tools).
- Introduction to scripting for basic automation (PowerShell, Bash).

MODULE 7: SECURITY, UPDATES, AND USER MANAGEMENT

- Creating and managing local users and groups.
- OS-based firewalls (Windows Defender, UFW/Firewalld in Linux) and essential configuration.
- Patch management and automatic updates.
- Basic security best practices: passwords, permissions, service hardening.
- Introduction to audit logs and system monitoring.

MODULE 8: TROUBLESHOOTING, OPTIMISATION AND DOCUMENTATION

- Diagnosing common network and system issues: connectivity, performance, access.
- Tools: ping, traceroute, ipconfig/ifconfig, nslookup, Event Viewer, syslog.
- System optimisation tips: cleaning, updates, startup management.
- Importance of documentation: change logs, network diagrams, user guides.
- Hands-on: case-based troubleshooting exercises.

MODULE 9: INTEGRATION PROJECT – BUILDING A REALISTIC NETWORKED ENVIRONMENT

- Planning a small mixed-OS network: requirements and design.
- Implementation: OS installation, configuration, resource sharing, security.
- Documentation: diagrams, procedures, users, issues faced.
- Project presentation and peer feedback.

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

MOBILITY FRIENDS
TRAINING CENTER

DGERT

ENTIDADE FORMADORA CERTIFICADA

Certified by DGERT - Directorate General
for Employment and Labor Relations

www.mobilityfriends.org

TRAININGCOURSES@MOBILITYFRIENDS.ORG

+351 253 144 226 / +351 960 285 416

/MOBILITYFRIENDS

@MOBILITYFRIENDSOFFICIAL

MOBILITY FRIENDS

MOBILITY FRIENDS