



# MFE-IT

Reference: RS/EN/R1

## Rust Training Course

Learn to Program Safely, Quickly and Without Runtime

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*Duration: 3 Days | Hours: 21 h*

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*Remote · Sessions guaranteed from 1 registrant · 60% hands-on practice*

## DESCRIPTION

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Rust is a modern compiled language designed to offer memory safety without compromising performance. At the crossroads of C++ and functional languages, Rust allows you to create robust and fast software without segmentation faults or memory leaks, thanks to its unique ownership and borrowing model checked at compile time.

This Rust training course offers a progressive learning curve, from syntax to advanced concepts, building real programs along the way (CLI tools, web servers, low-level utilities). It is the language of choice for system programming, embedded development, WebAssembly and high-performance backends.

## LEARNING OBJECTIVES

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By the end of this training course, participants will be able to:

- Understand the syntax and philosophy of the Rust language
- Master memory management without a garbage collector
- Master key concepts: ownership, borrowing and lifetimes
- Create robust, high-performance and tested programs
- Use crates, Cargo and the module system
- Handle errors with Result, Option and the ? operator
- Build a CLI or server application with Tokio or Actix-web

## PREREQUISITES

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- Knowledge of a compiled language (C, C++, Java, Go) or structured interpreted language (Python, JS)
- Basic knowledge of algorithms and control structures
- Comfortable using a terminal and a code editor (VS Code, JetBrains)

*Because each participant is unique, a personalised interview is systematically organised in advance with our expert to design a training programme perfectly aligned with their objectives, level and professional challenges.*

## TARGET AUDIENCE

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Back-end developers, C/C++ or Go developers wishing to modernise their stack, and any developer curious about modern low-level paradigms.

## DETAILED PROGRAMME

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The training alternates between theoretical input and hands-on practice (approximately 60% of the time). Modules are built around practical exercises based on real-world business use cases.

### Module 1 – Introduction to Rust and Tools

- Philosophy of Rust and Rustup installation
- Cargo: building, running and testing projects
- First .rs files and structured Hello World

### Module 2 – Basic Syntax and Types

- Primitive types, functions and mutability
- Flow control, match and pattern matching
- Introduction to ownership semantics

### Module 3 – Ownership, Borrowing and Lifetimes

- Memory safety without a garbage collector
- Mutable and immutable references
- Lifetimes and the borrow checker

### Module 4 – Structures, Enums and Modules

- Structs, tuples and enums
- Implementation blocks and methods
- Visibility and code organisation in modules

### Module 5 – Idiomatic Error Handling

- Option and Result types
- Error propagation with the ? operator
- unwrap, expect, match and panic strategies

## Module 6 – Collections, Traits and Generics

- Vectors, hash maps and slices
- Trait implementation and trait objects
- Generics and explicit lifetimes

## Module 7 – Practical Projects

- Creating a CLI tool (file generator, log analyser)
- Introduction to Actix-web or Rocket for simple web servers
- Introduction to Tokio for asynchronous programming

## TEACHING METHODS

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### Format and Delivery

The training is delivered remotely via an interactive virtual classroom. It can also be delivered on-site, with content customised to match the needs of your professional project. The theory/practice split is approximately 40%/60%.

### MFE-IT Ultra-Personalised Format

Each session accommodates between 1 and 3 participants, ensuring highly individualised support. A preliminary interview allows us to tailor the content to each participant's profile. Inter-company sessions are guaranteed from just 1 registrant (except in cases of force majeure).

### Skills Assessment

Throughout the training, the trainer assesses participant progress through multiple-choice questions, role-playing exercises and hands-on work. At the end, a certificate of achievement is issued to each participant.

### Post-Training Support

For one month following the training, each participant can contact MFE-IT trainers with questions about implementing acquired knowledge. A response is provided by email or telephone within 48 working hours.

### Accessibility

MFE-IT is committed to welcoming people with disabilities. Contact: [contact@mfe-it.com](mailto:contact@mfe-it.com).

## PRACTICAL INFORMATION

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### Trainer Resources

- Structured demonstrations aligned with the detailed programme
- Exercise briefs and solutions throughout the training
- A ready-to-use technical environment for practical workshops
- Trainer validation of acquired knowledge at the end of each workshop
- Digital reference documents

### Certification and Validation

At the end of the training, a certificate is sent by email specifying the objectives, nature, duration and assessment results. A completion certificate can also be provided on request.

### Benefits for Participants

- Train from your workplace or home, with no travel required
- Benefit from an expert trainer-consultant on the subject
- Enjoy an ultra-personalised format (1 to 3 participants)
- Continue training even in the event of unforeseen circumstances

### Benefits for the Organisation

- Optimise the training budget by reducing travel and accommodation costs
- Offer quality training to all employees, regardless of location
- Reduce absence time linked to travel
- Support team upskilling in all contexts