Lecture Slides and Video Recordings

The presentation slides used in these lectures will be posted in this page before the lectures, and may be updated after each lecture is concluded. There are a total of **12** lectures in this course, each two hours.

1 Introduction to the Course

- About me
- Goals and the course structure (4 assignments, 1 project)
- Course website
- Textbook
- Grading policy
- Advantages of the Rust programming language

2 Learning Rust the Hands-On Way

- Reading the errors carefully
- Installing and using the Rust toolchain
- Creating, building, and running the first Rust project
- Implementing a guessing game

Video recording (Part 1) (September 5, 2025)

Video recording (Part 2) (September 5, 2025)

Video recording (Part 1) (September 12, 2025)

3 Basic Programming Concepts

- Mutable and immutable variabls
- Static types
- Scalar data types
- Compound data types
- Functions
- If expressions
- Loops

Video recording (Part 2) (September 12, 2025)

4 Ownership and the String Type

- Ownership: a unique feature in Rust towards memory safety
- The `String` type
- References and borrowing
- String slices

Video recording (Part 1) (September 19, 2025)

Video recording (Part 2) (September 19, 2025)

5 Structs and Enums

- Defining and instantiating structs
- Methods
- Enums
- Options
- Pattern matching
- The power of enums
- Characteristics of object-oriented languages

Video recording (Part 1) (September 26, 2025)

Video recording (Part 2) (September 26, 2025)

6 Error Handling

- Recoverable and unrecoverable errors
- Handling unrecoverable errors with `panic!`
- Handling recoverable errors with `Result`
- When should we `panic!`?
- Creating custom types for validation

Video recording (Part 1) (October 3, 2025)

Video recording (Part 2) (October 3, 2025)

7 Vectors and Hash Maps

- Storing lists of values in vectors
- Storing key-value pairs in hash maps

8 Generics and Traits

- Generic data types
- Traits: defining shared behaviour across structs

Video recording (Part 1) (October 10, 2025)

Video recording (Part 2) (October 10, 2025)

9 Lifetimes

- Providing hints to the compiler using lifetimes

> This lecture on October 17, 2025 will not be recorded.

10 Functional Rust

- Closures: anonymous functions
- Processing a collection of items with iterators

Video recording (Part 1) (October 24, 2025)

Video recording (Part 2) (October 24, 2025)

11 Smart Pointers

- Using `Box<T>` to allocate memory on the heap
- Trait objects
- Dynamically sized types and the `Sized` trait
- Wide pointers
- The `Deref` trait and deref coercion
- The `Drop` trait
- `Rc<T>`, the reference-counted smart pointer
- `RefCell<T>` and the interior mutability pattern

Video recording (Part 1) (November 7, 2025)

Video recording (Part 2) (November 7, 2025)

12 Fearless Concurrency — Threads

- Multi-threaded programming
- The actor model
- Message passing using channels
- `Send` + `Sync` marker Traits
- Atomic types from the Rust standard library

Video recording (Part 1) (November 14, 2025)

Video recording (Part 2) (November 14, 2025)

13 Asynchronous Rust

- Asynchronous Rust with stackless coroutines
- Asynchronous runtimes
- Futures and `async` / `.await`
- A real-world example: `page_title()`
- Desugaring `async` and `#[tokio::main]
- Deep dive: What's a `Future` anyway?
- `Pin` and the `Unpin` marker trait
- What's a `Waker`?
- Spawning and joining tasks

Video recording (Part 1) (November 21, 2025)

Video recording (Part 2) (November 21, 2025)

14 Best Practices and Idiomatic Rust

- Using Clippy for static checking
- Writing and running tests using `cargo test`
- Unit vs. integration tests
- Managing large projects with packages, crates, and modules
- Design patterns and the *singleton* design pattern
- Idiomatic Rust

Last updated on November 23, 2025