

## GO-101 GO LANGUAGE ESSENTIALS

**Course Length:** 4 days of Go Language Essentials + 1 day of Introduction to Cloud Native Programming in Go, 5 days altogether

### Course Description

Go is a recent programming language, developed at Google. It has been first released in 2009 and its version 1.0 came out in 2012. Go quickly become popular, especially for cloud native environments. It is used by Google in house (e.g., for implementing YouTube), and by several leading IT companies, including Uber, SoundCloud, Dropbox and Twitch. Docker and Kubernetes were also written in Go. We can safely say that by now Go is the de-facto standard programming language of cloud native applications.

In this course we introduce participants to this extremely efficient language with plenty of examples and exercises. We also give an insight to cloud native programming with Go, certainly also with active participations of the course attendees.

Join us to this exciting learning experience! Let's Go!

**Structure:** 50% theory 50% hands on lab exercises

### Prerequisites

No prior Go or cloud native development skills are required. It is essential, however, that the attendees have experience in programming in at least one language, such as C, C++, C#, Java, Javascript, Perl, Python, etc. No object-oriented programming skills are required.

### Materials

Participants will be provided with a course material in PDF format, as well as plenty of sample Go files for educational use. The course package also contains several exercises along with their suggested solutions.

## Detailed Course Outline

### Module 1: Introduction to Go

- About Go
- Compiler, tools, and IDEs
- Packages and modules

### Module 2: Go Language Basics

- The Go syntax
- Identifiers, variables, assignment
- Type declaration
- Pointers, new()
- Variable lifetime and visibility
- Control structures

### **Module 3: Basic Data Types**

- Operators and precedence
- Numeric and logic types
- Strings, runes, and UTF-8

### **Module 4: Composite Data Types**

- Arrays and Slices
- Maps
- Structs

### **Module 5: Functions and methods**

- Function declaration
- Function literals, closures, variadic functions
- Special in Go: defer, panic, and recover
- Go and OOP – an overview
- Methods and receivers
- Methods with pointer receivers
- Type composition with structure embedding

### **Module 6: Interfaces**

- Interface declaration, usage
- Examples from the standard library
- Type assertion, type switch

### **Module 7: Concurrency in Go**

- Understanding concurrency and parallelism
- Goroutines
- CSP: channels, select
- Mutual exclusions

### **Module 8: File Handling and Networking**

- Basic file I/O
- Using the JSON package
- Introduction to TCP/IP networking

### **Module 9: Introduction to Cloud Native Programming in Go**

- What is cloud native programming?
- The twelve-factor app
- The context package

### **Module 10: Cloud Native Patterns with Go**

- Scalability patterns
- Concurrency patterns