# Go Programming Essentials

- 5 Day Course
- Lecture & Labs
- Every course includes the opportunity to earn a Golang Basics certification from Alta3 Research.

## Course Overview

Go is designed to be concise, clean, and efficient. It is easy to write programs that get the most out of multicore and networked machines, while its novel type system enables flexible and modular program construction. Go compiles quickly to machine code yet has the feel of a dynamically typed, interpreted language.

Be it system admins, network, cloud, or storage engineers, all lessons in our courseware are highly relevant for using Go to craft enterprise solutions.

Class is a combination of live instructor demo and hands-on labs.

Review this course online at https://www.alta3.com/courses/golang

## Who Should Attend

- Software Developers
- System Administrators
- Network Engineers
- DevOps Operators

## What You'll Learn

- Current Go Standard Library
- Relevant networking libraries
- Version control with git
- Git integration with popular SCM (GitHub)
- Executing system commands
- Parsing and building files
- Consuming RESTful APIs with Go
- Creating a RESTful API with Go
- Parsing JSON
- Parsing XML files
- Building a simple web app with Go
- Containerizing Go Apps with Docker
- Interaction with databases
- Project structure best practice techniques
- AI LLM prompt engineering for Go snippets and solutions

## Outline

Certification

- Lecture + Lab: Alta3 Research Go Certification

AI Lab Assistance

Software Control Management

- Lecture + Lab: SCM Option #1 - GitHub
- Lecture + Lab: SCM Option #2 - GitLab

Up and Running with Go

- Lecture + Lab: Getting Started with Go
- Lecture: Go IDEs
- Lecture + Lab: The Go Playground
- Lecture: An Overview of Go
- Lecture + Lab: An Overview of Go

Basics

- Lecture + Lab: Practice with Variables
- Lecture + Lab: Go Basic Types
- Lecture + Lab: Go Constants
- Lecture: String Formatting
- Lecture + Lab: String Formatting

Composite Types

- Lecture: Arrays
- Lecture + Lab: Go Arrays
- Lecture: Slice
- Lecture + Lab: Slices
- Lecture + Lab: Go Functions
- Lecture + Lab: Struct Type
- Lecture + Lab: Go Receiver Functions (Methods)
- Lecture + Lab: Pointers
- Lecture + Lab: Maps
- Lecture: init Function
- Lecture + Lab: Variadic Functions

Idiomatic Go

- Lecture + Lab: Conditionals
- Lecture + Lab: Switch and Case
- Lecture + Lab: Looping
- Lecture + Lab: Panic
- Lecture + Lab: Defer
- Lecture + Lab: Recover

User Input

- Lecture + Lab: Reading in Console Input
- Lecture + Lab: Arguments
- Lecture + Lab: Flags
- Lecture + Lab: Environmental Vars

Parsing and Generating

- Lecture + Lab: Text Files
- Lecture + Lab: JSON Files
- Lecture + Lab: XML Files
- Lecture + Lab: CSV Files
- Lecture + Lab: YAML Files
- Lecture + Lab: Go Templates

Beyond Basics

- Lecture + Lab: Executing system commands
- Lecture + Lab: Generating Randomness Go Guessing Game
- Lecture + Lab: Generating and Handling Errors
- Lecture + Lab: Interfaces
- Lecture + Lab: Sorting
- Lecture + Lab: Concurrency with Goroutines
- Lecture: Channels
- Lecture + Lab: Channels
- Lecture + Lab: Go Testing
- Lecture: Benchmark Testing
- Lecture: Test-Driven Development TDD

Network

- Lecture + Lab: Consuming RESTful APIs
- Lecture + Lab: HTTP GET requests
- Lecture + Lab: HTTP POST requests
- Lecture + Lab: Simple HTTP Servers
- Lecture + Lab: Simple File Servers
- Lecture + Lab: Sending Email SMTP

Database

- Lecture + Lab: SQL and SQL-like Databases

CI/CD

- Lecture + Lab: Containerizing your Go App with Docker
- Lecture + Lab: Life-cycling a GoLang Application with GitLab
- Lecture: Athens

Enterprise

- Lecture + Lab: Cobra-Cli
- Lecture + Lab: Go and Prometheus
- Lecture + Lab: Kafka Go Client

## Prerequisites

- Recommended to have some experience in another language, although, not required

## Certification

- Alta3 Research Go 101 - Certification Project