

Welcome

Concepts of Programming Languages - TH Rosenheim - WS 2020/2021
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A word cloud featuring various programming languages and paradigms. The words are arranged in a circular pattern, with some languages being larger and more prominent than others. The colors of the words vary, including shades of blue, green, orange, and red.

Visible languages and paradigms include:

- JavaScript
- PHP
- Perl
- NET
- XML
- Pascal
- Visual Basic
- Cobol
- Assembly
- Fortran
- Scheme
- Java
- Scripting
- Multiparadigm
- Squeak
- Ada
- Lisp
- Clojure
- Obfuscated
- Prolog
- HTML
- Reflective
- Declarative
- Ruby
- Erlang
- Data Structured
- Object-Oriented
- Procedural
- HyperCard
- PostScript
- Smalltalk
- C-sharp
- Distributed
- Imperative
- Interpreted
- MATLAB
- Yorick
- Object
- Logic-based
- LabVIEW
- Haskell
- Visual
- Logo
- AppleScript
- Occam
- Markup
- JavaScript

Course Requirements

- The course is designed as a master course.
- Solid programming skills in Java/C/C++ are required.
- It is assumed that students have some skills in Scala, Python or Ruby.
- For all code examples, we will use Go (Golang) as language.

Goal of the Course



- Learn how Go differs from other languages conceptually
- Gain skills to pick the right language for a given problem
- Knowledge about the concepts of existing programming languages
- Learn how to write professional code with Golang

Lectures

Lecture 1 - About Overview Introduction

Lecture 2 - Introduction to Golang

Lecture 3 - OOP with Go - Part I

Lecture 4 - OOP with Go - Part II

Lecture 5 - Functional Programming

Lecture 6 - Concurrent Programming

Lecture 7 - Distributed Programming

Lecture 8 - Systems Programming

Lecture 9 - Enterprise Programming and Modules

Lecture 10 - Microservices

Lectures

Lecture 11 - **Plugins**

Lecture 12 - **Summary**

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Structure of this course

- Recap - 15 min
- Lecture - 30 min
- Online Tutorials (Video) - 45 min
- Student Discussions - 30 min
- Introduction to Exercises - 15 min
- Exercises - 45 min (+ Homework)

Material

Learning Campus: PDFs only

Github: PDFs, Sources, Slides (Go Present Tool)

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Semester Work

15 Minutes presentation + 5-10 pages AsciiDoc document (written in English)

Examples:

- Compare Go **OOP** (Object Oriented Programming) with: Smalltalk C++ Eiffel Objective C Modula Lua
- Compare Go **FP** (Functional Programming) with: Haskell Clojure F#
- Compare Go **SP** (Systems Programming) with: C C++ Rust Ada D Swift
- Compare Go **Concurrency** with: Erlang Scala Actors D Occam
- Compare Go **Distributed Programming** with: JavaScript / NodeJS C++ Java / Quarkus Python
- Compare **Go** with: Typescript Ruby Python Kotlin Elm Elixir Crystal

Books

Donovan, Kernigham: The Go Programming Language

Sebesta: Concepts of Programming Languages

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Thank you

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