# Advanced Programming with Kotlin

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Fall 2018

The goal of this course is to introduce tools and best practices for "programming for programmers". When programming the libraries that other programmers use, you cannot focus on pure functional requirements alone. You have to pay special attention to the operational and developmental requirements[1] as scalability, robustness, reusability, testability.

Common to these requirements is that they depend on a sound architechture. The use of interfaces is a common feature to obtain those goals. A strongly typed language as Java or C# or even better Kotlin is well suited for creating such software.

To create new libraries or extend existing libraries, you have to understand the use of them. We'll look at streams and lambdas in Java 8 and Kotlin among other cool stuff, and also touch coroutines in Kotlin.

## Course content

The course will look at advanced programming using Kotlin with references to Java.

At the end of the course the students:

- Have a general knowledge of architechtures for programming libraries
- Have a general knowledge about the Kotlin programming language

[1] also known as "non functional" requirements

- Knows the concept of lambdas in Kotlin and Java
- Knows the working of streams in Kotlin and Java
- Knows how to support parallelism using streams (and coroutines)
- Knows how to create DSL (domain specific languages) in Kotlin
- Knows where to find additional information

At the end of the course the students can:

- Write libraries using Kotlin and Java
- Argue for a library's operational and developmental qualities
- Use advanced features as streams and lambdas

The students will in groups of two extend a library (chosen by the teachers), and create a library of their own (described in a synopsis, approved by the teachers). Both assignments are mandatory. Groups are expected to present thier solutions, and to review the solutions of two other groups.

## Exam

The exam is oral. The student will prepare a (app. ten minutes) presentation of the solution of one of the major assignments. Further discussions will be based on the presentation, but can include all aspects of the curriculum.

## Admission requisite

In order to be approved for the exam:

- Both assignments must be handed in
- At least 80 study points must be obtained

## Study points

- Hand in of major assignments (30 per assignment): 60
- Presentation of assignments (10 per assignment): 20
- Review of other groups assignments (10 per pair): 20