

# Kotlin for Education

Kotlin is a powerful real-world language suitable for teaching a wide range of computer science courses. Kotlin is loved by educators and students alike.



# Why Teach Kotlin



## The language of Android

Revamp your course with the first-choice language for [Android development](#).



## Academically recognized

22 of the top 100 universities in the Times Higher Education Rankings 2020 include Kotlin in their courses.



## Popular in the industry

Kotlin is used by Twitter, Reddit, Pinterest, Uber, Coursera, Evernote, Slack, and Trello, just to name a few.



## Supports multiple paradigms

Functional, imperative, object-oriented, and procedural programming can all be practiced with Kotlin.



## Easy to teach fundamental concepts

Kotlin makes it easy to teach algorithmic problem-solving, data structures, machine learning, compilers, databases, and many other concepts.



## Supports coding safety

Kotlin promotes writing programs correctly with static type checking, automatic memory management, and null safety.



## Modern and concise language design

Kotlin's syntactic simplicity makes it beginner-friendly, while at the same time, it offers sophisticated features that ambitious students can aspire to learn.



## Tooling and learning materials

IntelliJ IDEA Ultimate supports Kotlin as a first-class citizen and is [free for educators and students](#). The variety of teaching open source resources from the community is ever-evolving.



## Interoperable

Seamless interoperability with the JVM ecosystem means that Kotlin can make use of numerous existing libraries.

# Start Teaching Kotlin with These Resources

## IDE

A modern IDE like IntelliJ IDEA can help in learning Kotlin

[Free IntelliJ IDEA Ultimate Licenses](#)

[EduTools plugin](#)

[Getting started with IntelliJ IDEA](#)

## Android Development

Start using Kotlin to develop Android apps

[Kotlin documentation for Android](#)

Recommended by Google's Android Developer Relations team

[List of various resources](#)

[Converting from Java to Kotlin codelab](#)

[Use Kotlin Coroutines in Your Android App codelab](#)

[Android Room with a View codelab](#)

[Android Kotlin Fundamentals course](#)

## Online Courses

Check out these recommended online Kotlin courses

[Introduction to Kotlin Programming](#)

[Advanced Kotlin Programming](#)

[Kotlin for Java Developers](#)

## Documentation

The best place to start onboarding

[Getting Started](#)

[Basics](#)

## Books

Check out our [recommended reading](#)

## Playground

Master your Kotlin skills on real examples in the browser

[Playground](#)

[Hands-on Labs](#)

[Kotlin by Example](#)

[Koans](#)

## Community

Feel free to join our welcoming Kotlin community

[Forum](#)

[Slack](#)

[Stack Overflow](#)

[Blog](#)

If you would like to introduce Kotlin into your classroom or have any questions about teaching or learning Kotlin, please reach out to us at [education@kotlinlang.org](mailto:education@kotlinlang.org).

# Why Teach Kotlin

## The Language of Android

Revamp your course with the first-choice language for [Android development](#). Kotlin has natively supported the mobile development workflow and associated tools since 2017.

“ Kotlin is basically becoming the language of Android

Adam Porter, University of Maryland

Android development will become increasingly Kotlin-first.

[Google I/O 2019](#)

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## Academically Recognized

At least 82 universities from the Times Higher Education Rankings 2020 use Kotlin to teach Mobile Application Development, Object-Oriented and Functional Programming, Patterns in Software Engineering, Parallel/Concurrent Programming, Scientific Programming, and other courses (Source: internal Teaching Kotlin Study).

“ On numerous courses, where we proceed through Java to Kotlin, we are considering a Kotlin-first approach

Eamonn De Leastar, Waterford Institute of Technology

22

of the top 100 universities in the Rankings 2020 include Kotlin in their courses

# Why Teach Kotlin

## Popular in the Industry

Kotlin is used by renowned businesses and organizations of all sizes, including Twitter, Reddit, Pinterest, Uber, Coursera, Evernote, Slack, and Trello, just to name a few.

— Kotlin job postings have increased by more than 1400% since 2017.

Source: [Dice](#)

— Kotlin is one of the fastest-growing programming languages and ranked 4th in the [Github Octoverse 2019](#)

— [PYPL](#) ranks Kotlin as the 12th most popular programming language, with a high upward trend in 2020

## Easy to Teach Fundamental Concepts

Kotlin's industrial popularity has a sound educational foundation. It is a full-featured language that supports teaching various computer science and software engineering topics like algorithmic problem-solving, data structures, machine learning, compilers, databases, and more.

Kotlin is a great language for polyglot programming, as it builds on the students' previous programming experience and is simple to grasp for those with a Java or Python background.

“ Students are happy to have the chance to program in something they may have heard about

Ryan Stansifer, Florida Institute of Technology

“ I think our students benefit in general from being exposed to a wide range of programming languages, and I think it is valuable for them to gain experience in using more modern languages alongside the more traditional ones like Java and C++

Nick Efford, University of Leeds

# 4th

most loved programming language in the 2019

[StackOverflow Developer Survey](#).

Kotlin has a soft learning curve and makes it easy to migrate existing course materials.

# Why Teach Kotlin

## Student Motivation

Knowing that Kotlin is a marketable skill, students tend to be more enthusiastic in studying it. Another big motivator for students is learning a language that allows them to quickly see results from their code.

“ Nearly all my students have picked up Kotlin quite easily and really loved it, as compared with Java

Scott Stanchfield, Johns Hopkins University

88%

of students give positive feedback about learning Kotlin  
(Source: internal Teaching Kotlin Study)

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## Interoperable

Seamless interoperability with the JVM ecosystem means that Kotlin can rely on numerous existing libraries. Our handy Java-to-Kotlin converter provides excellent support to migrate Java code to Kotlin and helps students quickly learn the syntax if they are already familiar with Java.

Java programs can call Kotlin code without any overhead either. Kotlin can also be compiled to JavaScript to run in the browser or on Node.js, or into a standalone native binary targeting any major operating system.

“ Kotlin is faster to develop and comprehend what is happening; near 100% backwards compatibility makes it easy to show in Java and translate into Kotlin while still utilizing every available library from Java; Students seem to understand it fairly quickly

David Vaughn, University of Missouri–St. Louis

[Java-to-Kotlin converter](#)  
[Kotlin/JS](#)  
[Kotlin/Native](#)

# Why Teach Kotlin

## Supports Multiple Paradigms

Kotlin combines the major programming paradigms in an elegant way, making it possible to use functional, imperative, object-oriented, or procedural programming – all within the same language. With Kotlin's support for [coroutines](#), the concepts of concurrency and parallelism come naturally.

“ You are able to teach procedural programming for the very beginners without needing to describe classes. Thus, your course can be more consistent

Alexey Mitsyuk, HSE university

Kotlin supports functional, imperative, object-oriented and procedural programming

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## Supports Coding Safety

Kotlin promotes writing correct programs with static type checking and automatic memory management. It rules out null-pointer dereferences and has no explicit pointers or undetectable uninitialized variables.

“ Take the opportunity to teach something new, type safe and functional

Gaute Berge, University of Oslo

Type safety and null safety are among the favorite features of Kotlin instructors

# Why Teach Kotlin

## Modern and Concise Language Design

Kotlin's syntactic simplicity makes it beginner-friendly, while at the same time, it offers sophisticated features that ambitious students won't grow out of.

Kotlin allows students to focus on expressing their ideas and write less boilerplate code. Less code written also means less code to test and debug. Such language design makes Kotlin a highly productive language, and it also simplifies grading homework and understanding your students' code.

“ Simple syntax. Less code to get more done. At the same time Kotlin has advanced topics such as coroutines

Zaid Altahat, Northwestern University, University of Wisconsin–Parkside

Instructors love Kotlin's concise and expressive syntax.  
(Source: internal Teaching Kotlin Study)

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## Prepares Students for Careers

Teaching professional software engineering practices improves students employment prospects. In-class coding projects are typically fully functional Android applications, and real-world assignments are more engaging for students than abstract examples are.

“ Employment prospects and how the language will be on the resume are things to look at when choosing a language to teach

Ted Herman, University of Iowa

Kotlin job postings have increased by more than 1400% since 2017

[Dice](#)

# Why Teach Kotlin

## Tooling and Learning Materials

The top tools of the profession are packaged with the language. IntelliJ IDEA Ultimate supports Kotlin as a first-class citizen and is [free for educators and students](#). It offers great productivity features, such as smart code completion, code inspections, a visual debugger, and more. The educational EduTools plugin is also available to help learn and teach Kotlin programming. Educators can use existing interactive courses or create custom ones, with hands-on assignments and practice coding tasks. Integrated tests will automatically check the assignments and provide feedback. Kotlin offers various teaching and learning resources, case studies, and community resources.

“ JetBrains equipped Kotlin with the best available tooling to simplify development

Alexander Nozik, Moscow Institute of Physics and Technology

[Free IntelliJ IDEA Ultimate license](#)  
[EduTools plugin](#)  
[Documentation](#)  
[Playground](#)

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## Open Source Community

Open source at heart, Kotlin is a free language that runs on all major platforms. Kotlin is supported by, and evolves with the help of, its diverse and enthusiastic [community](#), which includes over 200 Kotlin User Groups all around the world, an active forum, Slack, Reddit, and Stack Overflow communities, and many other resources.

“ Freely available implementation is very important

Ryan Stansifer, Florida Institute of Technology

Join our community:  
[Forum](#)  
[Slack](#)  
[Stack Overflow](#)  
[Blog](#)

# Universities That Teach Kotlin

[Full List](#)

University	Location	Course
Stanford University	Stanford, CA, US	<a href="#">CS 193A: Android App Development</a>
Imperial College London	London, UK	<a href="#">161: Computing Practical 1</a>
University of Pennsylvania	Philadelphia, PA, US	<a href="#">CIS 195-202: Android</a>
Johns Hopkins University	Baltimore, MD, US	<a href="#">605.603 - Object-Oriented and Functional Programming in Kotlin</a>
University of California	Los Angeles, CA, US	<a href="#">Computer Science 131. Programming Languages</a>
Duke University	Durham, NC, US	<a href="#">Mobile Development Track</a>
Northwestern University	Evanston, IL, US	<a href="#">Hello Kotlin: Android Bootcamp with App Factory for grades 9-12</a>
University of Washington	Seattle, Washington, US	<a href="#">INFO 448 Android Mobile Development</a>
New York University	New York, NY, US	<a href="#">INFO1-CE9416 Android App Development Intensive</a>
University of Edinburgh	Edinburgh, UK	<a href="#">Computer Science Large Practical 2017-2018</a>

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[Full List](#)

University	Location	Course
University of Texas at Austin	Austin, TX, US	<a href="#">CS 371M Mobile Computing (51610)</a>
Technical University of Munich	Munich, DE	<a href="#">Patterns in Software Engineering (WS 2019/20)</a>
University of Illinois at Urbana-Champaign	Champaign, IL, US	<a href="#">CS 125 An Introduction to Computer Science</a>
University of California, UC Davis	Davis, CA, US	<a href="#">ECS 189E: Android and iOS Fundamentals</a>
University of California, UC Santa Barbara	Santa Barbara, CA, US	<a href="#">CS184 - Introduction to Mobile Application Development (using Android)</a>
Chinese University of Hong Kong	Hong Kong, CHN	<a href="#">193-179280-01 Introduction to Android Programming using Kotlin 之 Android 流動程式編寫入門</a>
Boston University	Boston, MA, US	<a href="#">MET CS 683 Mobile Application Development with Android</a>
Ohio State University	Ohio, OH, US	<a href="#">CSE 5236: Mobile Application Development</a>
Michigan State University	East Lansing, MI, US	<a href="#">CSE498, Collaborative Design</a>
Sungkyunkwan University (SKKU)	Seoul, KOR	<a href="#">Programming Languages &amp; Compilers</a>