KAZAKH-BRITISH TECHNICAL UNIVERSITY

**JSC «Kazakh-British Technical University»**
**School of IT and Engineering**

**APPROVED BY**
**Dean of SITE**
**Azamat Imanbayev**
**_____**
**«____» _____ 2025**

# SYLLABUS

**Discipline:** Advanced Android. Spring
**Number of credits: 3**
**Course code - INFT3137**
**Term:** Spring 2025
**Instructors full name: Amangeldi Daniyar**

| Personal Information about the Instructor | Time and place of classes | | Contact information |
|---|---|---|---|
| | Lessons | Office Hours | e-mail |
| Amangeldi Daniyar | According to the schedule | Will be appointed | da_amangeldi@kbtu.kz |

**COURSE DURATION:** 3 credits, 15 weeks, 45 class hours

## COURSE DESCRIPTION

This course provides a deep dive into Android app development, covering essential topics ranging from Kotlin basics to advanced Android components, libraries, databases, networking, and design patterns. Through hands-on projects and guidance on app release, students will acquire a comprehensive skill set to excel in real-world Android development scenarios.

## COURSE OBJECTIVES

1. **Master Android Fundamentals**: Acquire a solid grasp of Kotlin programming, Android project structure, and the core components of Android app development, including Activities, Fragments, and UI design.
2. **Build Advanced Android Apps:** Learn how to develop sophisticated Android applications that utilize RecyclerViews, libraries like Retrofit and Room, and architectural patterns like MVVM. Gain proficiency in handling databases, networking, and multithreading.
3. **Prepare for Real-World Deployment:** Develop practical skills in app testing, debugging, and deployment to the Google Play Store. Understand app signing, dependency injection, and design patterns to create robust and market-ready Android applications.

## COURSE OUTCOMES

1. Students will gain the ability to create complex Android applications using Kotlin, with expertise in app architecture, networking, and user interface design.
2. Graduates will be well-prepared for careers in Android app development, with the skills needed to build high-quality, industry-standard applications.

## LITERATURE

1. Android Fundamentals: https://developer.android.com/
2. Kotlin Documentation: https://kotlinlang.org/docs/home.html
3. Online platform for learning mobile development: https://www.kodeco.com/android/paths/learn

### Course assessment criteria

Assessment occurs continuously throughout the course. The evaluation will be based on the levels of (maximums in %):

| Type of activity | Final scores |
|---|---|
| **Midterm** | **15%** |
| **Endterm** | **15%** |
| **Practice works** | **30 %** |
| **Final exam*** | **40%** |
| **Total** | **100%** |

*Students who get more points than the required maximum for in-class, final testing are awarded bonus points in the amount exceeded.

**COURSE CALENDAR**

| Week | Class work | | | SIS (students independent study | TSIS (teacher supervised independent study) |
|---|---|---|---|---|---|
| | Topic | Lectures | Practice | | |
| 1 | **Advanced Kotlin**<br>- High-order functions<br>- Inline functions<br>- Extensions functions<br>- Property Delegation<br>- Lazy, lateinit<br>- Sealed class, enum class | 2 | 1 | | |
| 2 | **Navigation Architecture Component**<br>- Navigation Graph<br>- Navigation Controller<br>- Safe Args | 2 | 1 | | |
| 3 | **Intents and Deeplinking**<br>- Activity Manager<br>- Explicit and Implicit Intents<br>- Deeplinks and Applinks | 2 | 1 | | |
| 4 | **Advanced Android Components #1**<br>- Service and WorkManager | 2 | 1 | | |
| 5 | **Advanced Android Components #2**<br>- Broadcast Receiver<br>- ContentProvider | 2 | 1 | Lab1 | |
| 6 | **Advanced Networking**<br>- WebSockets<br>- POST<br>- Advanced Okhttp configuration | 2 | 1 | | |
| 7 | **Dependency Injection With Koin** | 2 | 1 | | |
| 8 | **Midterm Exam** | 2 | 1 | | |
| 9 | **Clean Architecture**<br>- Modularization with Data, Domain and Presentation layers | 2 | 1 | | |
| 10 | **Testing**<br>- Implementation of Unit Testing | 2 | 1 | | |
| 11 | **Publishing Android Library** | 2 | 1 | Lab2 | |

| | | | | | |
|---|---|---|---|---|---|
| 12 | **Firebase Integration**<br>- Crashlytics, Analytics<br>- RemoteConfig<br>- RealtimeDatabase<br>- CloudMessaging | 2 | 1 | | |
| 13 | **Introduction to Jetpack Compose #1** | 2 | 1 | | |
| 14 | **Introduction to Jetpack Compose #2** | 2 | 1 | | |
| 15 | **Endterm** | 2 | 1 | | |
| 16-17 | **Final Exam** | | | | |

**Class sessions –** will be a mixture of information, discussion and practical application of skills.

**Practice –** will reinforst the students knowledge by practical appliance of lectured materials.

**In-class assessment** – will prepare students for their mid-term and final assessment and identify the competence level they have achieved on a related subject matter, the aim being to diagnose potential discrepancies in students' understanding and performance in order to make specific adjustments to the course content and procedures and/or to assign additional assignments to certain individuals or the whole group.

**Home assignments** – will consolidate the concepts and materials taken during in-class activities, help students to expand the content through diverse background resources and/or practise certain skill areas; they will also develop the students' ability to work individually in exploring and examining related issues.

**SIS** (Student Independent Study) – comprises group Project to be done by students on the independent basis. Students are supposed to use knowledge and skills acquired in class to do the project. Assistance and advice will be provided by teachers during office hours.

**TSIS (**Teacher Supervised Student Independent Study) – student self-made project.

**End-term test –** a diagnostic test used to identify the students' progress, their strengths and weaknesses, intended to force student to prepare for Final Exam. It includes computer based test.

**Final examination** – 1) an attainment test designed to identify how successful the students have been achieving objectives.

**Grading policy:**
Intermediate attestations (on 8th and 15th week) join topics of all lectures, practice, laboratories and materials for reading discussed to the time of attestation. Maximum number of points within attendance, activity, laboratories for each attestation is 30 points.
Final exam joins and generalizes all course materials, is conducted in the the form of a project defense, which is a completed Android application. Maximum number of points is 40. At the end of the semester you receive overall total grade (summarized index of your work during semester) according to conventional KBTU grade scale.

Attention!

1) If a student misses more than 30% of the classes in the discipline, an "F" grade is given for the discipline.
2) If for two attestations student receives 29 or less points, this student is not accepted to final exam and for all course he (she) receives «F (Fail)» grade;

3) If student receives on final exam 19 or less points, then independently on how many points he (she) received for two attestations, in whole he (she) receives «F (Fail)» grade;

In the case of missing or being late for final exam without plausible reason, independently on how many points he (she) received for two attestations, in whole he (she) receives «F (Fail)» grade.

**Academic Policy:**

- Cheating, duplication, falsification of data, plagiarism are not permitted under any circumstances!
- Students must participate fully in every class. While attendance is crucial, merely being in class does not constitute "participation". Participation means reading the assigned materials, coming to class prepared to ask questions and engage in discussion.
- Students are expected to take an active role in learning (the instructor will provide the information and guidelines to do this).
- Students must come to class on time.
- Students are to take responsibility for making up any work missed.
- Make up tests in case of absence will not normally be allowed.
- Mobile phones must always be switched off in class.
- Students should always show tolerance, consideration and mutual support towards other students.

**Students are encouraged to**

- consult the teacher on any issues related to the course;
- make up within a week's time for the works undone for a valid reason without any grade deductions;
- make any proposals on improvement of the academic process;
- track down their continuous rating throughout the semester.