KHMELNYTSKYI NATIONAL UNIVERSITY

APPROVED BY

Dean of the Faculty of Information Technologies

_____ Tetiana HOVORUSHCHENKO
Signature Name, SURNAME

"1" 09 2025

WORK PROGRAM OF THE ACADEMIC DISCIPLINE

Mobile Android Application Design
Discipline title

Purpose of the Work Program	For educational programs of various specialties
Level of Higher Education	First (bachelor's)
Language of Instruction	English
Discipline Volume, ECTS Credits	8
Discipline Status	Selective
Faculty	Information Technologies
Department	Computer Science

Form of Education	Discipline Volume		Number of Hours						Form of semester control
			Classroom Sessions					Independent work (including IT)	
	ECTS Credits	Hours	Total	Lectures	Laboratory Session	Practical Sessions	Seminar Sessions		Credit
Full-time	8	240	68	32	36			172	+

The work program is based on the educational programs of bachelor's training and the standard of higher education of the specialty

Work program compiled by _____ Ph.D. in E. S., As. Prof. Oleksandr MAZURETS
Signature Academic degree, academic title, Name, SURNAME

Work program compiled by _____ Assist. Prof. of the CS Department Olga ZALUTSKA
Signature Academic degree, academic title, Name, SURNAME

Work program compiled by _____ Assist. Prof. of the CS Department Valeria KLIMENKO
Signature Academic degree, academic title, Name, SURNAME

Approved at the meeting of the Computer Science Department

Protocol from 29.08.2025 # 1 .

Head of the Computer Science Department _____ Oleksandr BARMAK
Title Signature Name, SURNAME

Khmelnytskyi 2025

3. Explanatory note

The discipline «Mobile Android Application Design» belongs to the cycle of elective disciplines and is aimed at developing professional skills in the design and development of mobile applications for the Android operating system. It provides mastery of modern technologies and principles of building application architecture, creating user interfaces, working with databases and network services. Mastering the discipline contributes to the development of programming, testing, optimization and teamwork skills.

The purpose of the discipline. Formation of system knowledge and practical skills in developing mobile applications for the Android operating system using Java and Kotlin programming languages among higher education students. The discipline is aimed at developing the ability to design, create and optimize mobile solutions that can effectively interact with databases, multimedia resources, services and external APIs.

Subject of the discipline. Methods, tools and technologies for designing and developing mobile applications on the Android platform using the Android Studio environment, Java and Kotlin languages, SQLite database, asynchronous processing tools, multimedia components and integration with Google Maps API.

Objectives of the discipline. Mastering the Java and Kotlin programming languages for mobile development; mastering the principles of building a graphical user interface and the Activity life cycle; acquiring skills in working with adapters, SQLite databases, the network, data parsing and services; studying the means of implementing multimedia functions and mapping services; developing skills in debugging, testing and publishing mobile applications; developing analytical thinking, independence, responsibility and team interaction in the process of creating mobile software products.

Learning results. After studying the discipline, the student must know the principles of building Android applications, the component life cycle, tools for creating a user interface, working with events, databases, the network and multimedia; have practical skills in working with Android Studio, Java and Kotlin languages, asynchronous processing tools, Retrofit, ExoPlayer and Google Maps API libraries; be able to design, develop, test and optimize mobile applications; make a reasoned choice of technologies and tools; demonstrate the ability to self-study, work in a team and make effective engineering decisions.

4. Structure of credits for the discipline

Title of section (topic)	Number of hours allocated to:		
	lectures	laboratory classes	ISW
Chapter 1. Using Java and Kotlin to Develop Mobile Applications	10	8	16
Chapter 2. Creating Multi-Page Mobile Applications	4	8	32
Chapter 3. Working with SQLite Databases in Mobile Applications	4	4	20
Chapter 4. Working with Parsers in Mobile Applications	4	8	40
Chapter 5. Working with Multimedia	10	8	64
Total per semester:	32	36	172

5. Academic discipline program

5.1 Lecture course content

Lecture number	List of lecture topics, their annotations	Number of hours
	Chapter 1. Using Java and Kotlin to Develop Mobile Applications	**6**
1	Java Fundamentals for Android Mobile Application Programming. Kotlin Fundamentals for Android Mobile Application Programming. Ref: [1], [2]	2
2	Installing Development Tools. Creating a Project in Android Studio. Running the Application. Ref: [1], [2], [3]	2
3	Running the Application. Activity Class and Resources. Creating a Graphical Application Ref: [2], [3]	2
	Chapter 2. Creating Multi-Page Mobile Applications	**8**
4	Android application components. Activity concept. Activity lifecycle Activity lifecycle management. Introduction to interface creation. Getting elements in code and their identifiers. Ref: [3], [4]	2
5	The graphic capabilities of Android Studio. Various layout options for interface elements (Layout). Units of measurement for screen element sizes. TextView, EditView, Button, Checkbox, RadioButton controls. Creating event handlers and binding them to controls. Ref: [1], [4], [5]	2
6	Adapters. Other types of adapters. ArrayAdapter. Selecting an element in a ListView. Adding and removing from a ListView. Ref: [1], [2], [3], [4]	2
7	Intents and data transfer between activities. Data transfer between Activities. Getting a result from an Activity Ref: [1], [2]	2
	Chapter 3. Working with SQLite Databases in Mobile Applications	**4**
8	Connecting to a SQLite database. SimpleCursorAdapter and retrieving data. Adding, deleting, and updating data in SQLite. Ref: [1], [4]	2
9	Using an existing SQLite database. Dynamically searching a SQLite database Ref: [2], [4]	2
	Chapter 4. Working with Parsers in Mobile Applications	**6**
10	Data parsing in Android. Data types for parsing. JSON. XML. Other libraries for data parsing in Android. Parsing data from the Internet using the example of the Retrofit library. Ref: [3], [4]	2
11	Multithreading and asynchrony. Ref: [5], [6]	2
12	Services. Creation services. Vital cycle services. Launching services and managing its reboot. Launching and stopping services. Limitation of rights services. Foreground service. Systemic services. Ref: [7], [8]	2
	Chapter 5. Working with Multimedia	**8**
13	Broadcast messages. Permissions for broadcast messages. Ref: [4], [6]	2
14	Working with images. Image resources. ImageView. Images from the assets folder Animation. Tween animation.	2

	Ref: [2], [5], [9]	
15	Working with sound in Android. MediaPlayer. AudioManager. SoundPool. Creating your own audio effects in Android. Working with Android video. Playing video using VideoView. Controlling video using MediaPlayer. ExoPlayer. Recording video. Ref: [2], [4], [10]	2
16	Google Maps API. Registering and obtaining an API key. Adding a map to a mobile application using the Google Maps API. Adding markers to a map. Ref: [3], [4], [10]	2
	Total per semester:	**32**

5.2 Laboratory content

№	Laboratory lesson topic	Number of hours
1	Installing, configuring the Android Studio working environment and creating a simple application Ref: [1], [2]	4
2	Creating a simple Android mobile application. Ref: [3], [4]	4
3	Creating a multi-page mobile application. Ref: [2], [3], [4]	4
4	Improving the created multi-page mobile application Ref: [3], [4], [5]	4
5	Working with the SQLite database. Ref: [3], [4], [5], [6]	4
6	Developing a multi-page mobile application. Ref: [1], [7], [9]	4
7	Working with parsers in mobile applications. Ref: [3], [4]	4
8	Working with multimedia. Ref: [2], [3], [10]	8
	Total per semester:	**36**

5.3 Content of independent (including individual) work of a higher education student

Independent work of students of all forms of education consists of the systematic study of program material from relevant sources of information, preparation for laboratory work, tests, and completion of individual tasks. Students are provided with the department's page in the Modular Learning Environment, where the Working Program of the discipline and the necessary materials for its educational and methodological support and control of learning results are posted.

Week number	Type of independent work	Number of hours
1-2	Studying lecture material. Preparing for laboratory work No. 1. Preparing for the defense of laboratory work No. 1.	16
3-4	Studying lecture material. Preparing for laboratory work No. 2. Preparing for the defense of laboratory work No. 2.	16
5-6	Studying lecture material. Preparing for laboratory work No. 3. Preparing for the defense of laboratory work No. 3.	16
7-8	Studying lecture material. Preparing for laboratory work No. 4. Preparing for the defense of laboratory work No. 4. Beginning of individual task No. 1 of independent work.	20
9-10	Studying lecture material. Preparing for laboratory work No. 5. Preparing for the defense of laboratory work No. 5. Completing individual task No. 1 of independent work.	20
11-12	Studying lecture material. Preparing for laboratory work No. 6. Preparing for the defense of laboratory work No. 6. Beginning of individual task No. 2 of independent work.	20
13-14	Studying lecture material. Preparing for laboratory work No. 7. Preparing for the defense of laboratory work No. 7.	20
15-16	Studying lecture material. Preparing for laboratory work No. 8. Preparing for the defense of laboratory work No. 8. Completing individual task No. 2 of independent work.	20
17	Studying lecture material. Preparing a report on independent work. Drawing up a report on independent work. Presentation of the results of the individual task.	24
	Total per semester:	**172**

Students are assigned individual homework assignments (IDAs) on relevant topics, as specified in the methodological recommendations for laboratory classes and independent work. The guidance of independent work and control over the implementation of individual assignments is carried out by the teacher according to the schedule of consultations outside of class time.

The requirements for completing individual homework are outlined in the Modular Learning Environment on the subject page.

6. Technologies and teaching methods

The process of learning in the discipline is based on the use of traditional and modern technologies and teaching methods, in particular: lectures (using visualization methods, problem-based and interactive learning, motivational techniques, information and communication technologies); practical classes (using instruction, demonstration, solving typical and applied problems, case analysis, situational tasks, discussion elements, etc.); independent work (studying theoretical material, preparing for practical work, current and final control, performing individual and homework), using information and computer technologies and distance learning technologies.

7. Control methods

Current control is carried out during classroom laboratory classes, as well as on the days of control events established by the work program and schedule of the educational process, including using the Modular Learning Environment. The following methods of current control are used:

- oral interview before admission to the laboratory session;
- evaluation of the results of laboratory work defense;
- performing control work;
- presentation and defense of individual tasks.

The percent of the maximum score in any type of academic work is considered ***to have*** academic debt. Academic debt from semester control is eliminated during the examination session or according to the schedule established by the dean's office in accordance with the "Regulations on Control and Evaluation of Learning Results of Higher Education Applicants at KhNU".

8. Discipline Policy

The policy of the academic discipline is generally determined by the system of requirements for a higher education applicant, which are stipulated by the current regulations of the University on the organization and educational and methodological support of the educational process. In particular, passing a safety briefing; attending classes on the discipline is mandatory. For objective reasons (confirmed by documentation), theoretical training, in agreement with the lecturer, can take place online. Successful mastery of the discipline and the formation of professional competencies and program learning outcomes requires preparation for a laboratory class (studying theoretical material on the topic of the work, preparation for an oral interview for admission to the class (given in the Methodological recommendations for laboratory classes)), active work in the class, qualitatively prepare a report, defend the results of the work performed, participate in discussions regarding decisions made when performing laboratory work by applicants, etc.

Higher education students must adhere to the established deadlines for completing all types of academic work in accordance with the work program of the academic discipline. The deadline for defending laboratory work is considered timely if the student defends it at the next lesson after completing the work. The student is obliged to complete the missed laboratory lesson within the deadline established by the teacher, but no later than two weeks before the end of theoretical classes in the semester.

The student's assimilation of theoretical material in the discipline is checked in the process of current control during laboratory classes. The completion of an individual task is completed by its presentation within the time limits established by the schedule of independent work.

A higher education applicant, when performing individual work on a discipline, must adhere to the integrity policy (copying, plagiarism (including using mobile devices) are prohibited). If a violation of the academic integrity policy is detected in any type of academic work, the higher education applicant receives an unsatisfactory grade and must re-perform the tasks on the relevant topic (type of work) provided for in the work program. Any forms of violation of academic integrity ***are not allowed.***

Within the framework of studying the academic discipline, higher education applicants are provided with the recognition and enrollment of learning outcomes acquired through informal education, which are posted on accessible platforms that contribute to the formation of competencies and deepening of learning outcomes determined by the work program of the discipline, or ensure the study of the relevant topic and / or type of work from the program of the academic discipline (for more details, see the Regulation on the procedure for recognizing and enrolling learning outcomes of higher education applicants at KhNU).

9. Evaluation of student learning outcomes in the semester

Assessment of academic achievements of a higher education applicant is carried out in accordance with the "Regulations on monitoring and evaluating the results of higher education applicants at KhNU". During the ongoing assessment of the work performed by the applicant in each structural unit and the results obtained by him, the teacher assigns him a certain number of points from the Work Program established for this type of work. In this case, each structural unit of educational work can be credited if the applicant has scored at least 60 percent (the minimum level for a positive assessment) of the maximum possible amount of points assigned to the structural unit.

When assessing the learning outcomes of higher education applicants in any type of educational work (structural unit), it is recommended to use the following generalized criteria:

Table – Criteria for evaluating the academic achievements of a higher education applicant

Assessment and level of achievement by the applicant of planned PND and developed competencies	Generalized content of the evaluation criterion
Excellent (high)	The higher education applicant has deeply and fully mastered the content of the educational material, easily navigates in it and skillfully uses the conceptual apparatus; is able to connect theory with practice, solve practical tasks, confidently express and justify their judgments. An excellent grade assumes a logical presentation of the answer in the language of instruction (oral or written), demonstrates high-quality design of the work and mastery of special devices and tools, applied programs. The applicant does not hesitate when modifying the question, is able to make detailed and generalizing conclusions, demonstrates practical skills in solving professional tasks. When answering, he made two or three insignificant ***errors***.
Good (average)	The higher education applicant has demonstrated complete mastery of the educational material, possesses a conceptual apparatus, is oriented in the studied material; consciously uses theoretical knowledge to solve practical problems; the presentation of the answer is competent, but the content and form of the answer may contain individual inaccuracies, unclear formulation of rules, patterns, etc. The higher education applicant's answer is based on independent thinking. The higher education applicant made two or three ***insignificant errors in the answer***.
Satisfactorily (sufficient)	The higher education applicant has demonstrated knowledge of the basic program material in the amount necessary for further study and practical activity in the profession, copes with the implementation of practical tasks provided by the program. As a rule, the higher education applicant's answer is built at the level of reproductive thinking, the higher education applicant has weak knowledge of the structure of the academic discipline, makes inaccuracies and ***significant errors*** in the answer, hesitates when answering a modified question. At the same time, he has acquired the skills necessary to perform simple practical tasks that meet the minimum assessment criteria and has the knowledge that allows him to eliminate inaccuracies in the answer under the guidance of a teacher.
Unsatisfactorily (insufficient)	The higher education applicant has demonstrated disparate, unsystematic knowledge, is unable to distinguish between the main and secondary, makes mistakes in defining concepts, distorts their meaning, presents the material chaotically and uncertainly, and cannot use knowledge when solving practical tasks. As a rule, an “unsatisfactory” grade is given to a higher education applicant who cannot continue their studies without additional work on studying the academic discipline.

Structuring the discipline by types of academic work and evaluating the learning outcomes of full-time students studying in a semester

Classroom work								**Control measures**		**Independent work**		**Semester control**
Laboratory work No.:								Control work		IDW		Credit
1*	2	3	4	5	6	7	8	1	2	1	2	
Number of points for each type of academic work (minimum-maximum)												By rating
6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	3-5	3-5	3-5	3-5	
48-80								**6-10**		**6-10**		**60-100****

Notes: *For any type of academic work in the discipline, the number of points scored below the established minimum, the applicant receives an unsatisfactory grade and must retake it within the period established by the teacher (dean). The institutional grade is established in accordance with the table "**Correlation of the institutional assessment scale and the ECTS assessment scale**".

Assessment of the results of the defense of laboratory work

The laboratory work performed and designed in accordance with the requirements established by the Methodological Recommendations is comprehensively assessed by the teacher during its defense, taking into account the following criteria: independence and correctness of execution; completeness of the answer and knowledge.

The result of the performance and defense by the applicant of each laboratory work is assessed in accordance with the table of Criteria for assessing the academic achievements of the applicant for higher education.

If the applicant's level of knowledge is lower than 60 percent of the maximum score established by the Work Program for each structural unit, the laboratory work is not credited to him and to defend it, he must study the material on the topic of the work in more detail, the methodology for its implementation, correct gross errors and re-appear for its defense at the time designated by the teacher.

Assessment of the control work

The control work involves the performance of five tasks. When assessing the test work, the following are taken into account: the completeness of the answer and the quality of the performance. Each task is assessed with 1 point, the total amount of points for a positive assessment is from 3 to 5.

The distribution of points in the assessment of control work tasks

Number of correct answers	1	2	3	4	5
Percentage of correct answers	**0-59**		**60**	**80**	**100**
Number of points received	0		3	4	5

If you receive a negative grade, you must retake the test before the **next** test date.

Evaluating the results of individual tasks

An individual task (IT) completed and designed in accordance with the requirements specified in the Methodological Recommendations is comprehensively evaluated by the teacher, taking into account the following criteria: independence of execution; correctness of solving the tasks; reasonableness of the choice of solution methods; completeness of explanations and justification of answers; quality of design and compliance with the requirements for the structure and content of the work.

The result of the higher education student's performance of each IZ is assessed in accordance with the table of **Criteria for assessing the academic achievements** of a higher education student, taking into account the level of achievement of the planned program learning outcomes and formed competencies. Based on the results of the defense, the appropriate amount of points is assigned (minimum positive score - 3 points, maximum - 5 points).

If the higher education student has revealed a level of knowledge and performance of the IZ that is lower than 60 percent of the maximum number of points established by the Work Program for this structural unit, the task is not counted. In this case, the student must rework the content of the task, eliminate errors and submit the revised IZ for verification within the terms agreed with the teacher.

The final semester grade on the institutional scale and the ECTS scale is determined in an automated mode after the teacher enters the assessment results in points for all types of educational work into the electronic journal. The correlation between the institutional grading scale and the ECTS grading scale is given below in the table "Correlation".

A semester grade is issued at the last lesson, provided that the total amount of points accumulated by the applicant in the discipline (other educational component) according to the results of the current control is within the range of 60 to 100 points. In this case, the institutional scale is marked with the grade "passed", and the ECTS scale is marked with the letter designation of the grade corresponding to the number of points earned by the student in accordance with the Correlation table. The applicant's presence in this case is not mandatory.

Table – Correlation between institutional grading scale and ECTS grading scale

ECTS assessment	**Rating scale points**	**Institutional assessment** (level of achievement by a higher education student of the planned learning outcomes in the academic discipline)	
		Test	**Exam/differentiated test**
A	90-100	Enrolled	***Excellent*** – a high level of achievement of the planned learning outcomes in the academic discipline, which indicates the applicant's unconditional readiness for further study and/or professional activity in ***the*** specialty
B	83-89		***Good*** – average (maximum sufficient) level of achievement of planned learning outcomes in the academic discipline ***and*** readiness for further study and/or professional activity in the specialty ***Satisfactory*** – There are minimally sufficient learning outcomes in the academic discipline for further study and/or professional activity in the ***specialty***.
C	73-82		
D	66-72		
E	60-65		
FX	40-59	Not included	***Unsatisfactory*** / ***Fail*** – A number of planned learning outcomes in the academic discipline are missing. The level of acquired learning outcomes is insufficient for further study and/or professional activity in the specialty
F	0-39		***Unsatisfactory*** / ***Fail*** – No learning outcomes

10. Questions for self-monitoring learning outcomes

1. What are the main programming languages used for Android application development?
2. What is Android Studio and what are its main components?
3. Describe the structure of an Android project.
4. What is the role of the Android Manifest file?
5. Explain the purpose of Gradle in Android development.
6. What are the main differences between Java and Kotlin in Android development?
7. How is object-oriented programming implemented in Kotlin?
8. What are data classes in Kotlin and how are they used?
9. What is the difference between `val` and `var` in Kotlin?
10. How are null safety features implemented in Kotlin?
11. What is an Activity in Android?
12. Describe the Activity lifecycle and its key methods.

13. What is the difference between `onCreate()` and `onStart()`?
14. How can you save and restore Activity state during configuration changes?
15. What is an Intent and what types of Intents exist?
16. What is a layout in Android?
17. Compare LinearLayout, RelativeLayout, and ConstraintLayout.
18. What is the role of XML files in Android UI design?
19. How can event handlers be attached to UI elements?
20. What is the difference between TextView and EditText?
21. What is a ListView and how is it used?
22. What is an Adapter and what types of adapters exist in Android?
23. How does an ArrayAdapter work?
24. How can you pass data between Activities using Intents?
25. What is the purpose of `startActivityForResult()`?
26. What is SQLite and how is it used in Android applications?
27. How do you create and manage a database in Android?
28. What is the function of a Cursor in SQLite?
29. How can you insert, update, and delete data in SQLite?
30. What is the role of SimpleCursorAdapter in Android?
31. What is JSON and how is it used in Android applications?
32. What are the main differences between JSON and XML?
33. What is Retrofit and how is it used for data parsing in Android?
34. What is multithreading and why is it important in mobile applications?
35. What is the difference between synchronous and asynchronous tasks?
36. What is a Service in Android and when should it be used?
37. Describe the lifecycle of an Android Service.
38. What is a Foreground Service and how does it differ from a Background Service?
39. What are Broadcast Receivers and what are they used for?
40. What are permissions in Android and how are they managed?
41. How can you work with images in Android applications?
42. What is ImageView and how is it used?
43. What are the main types of animation supported by Android?
44. How can you play audio files in Android using MediaPlayer?
45. What is the role of SoundPool and when is it preferable over MediaPlayer?
46. How can video playback be implemented in Android applications?
47. What is ExoPlayer and what advantages does it have over MediaPlayer?
48. What is Google Maps API and how is it integrated into Android applications?
49. How do you obtain and use an API key for Google Maps?
50. How can markers and map interactions be implemented in a Google Maps–based Android app?

11. Educational and methodological support

The educational process in the discipline "Mobile Application Design" is provided with the necessary educational and methodological materials, which are placed in the modular learning environment MOODLE: Course " Mobile Android Application Design " https://msn.khmnu.edu.ua/course/view.php?id=6922

12. Material, technical and software support of the discipline

Information and computer support: PC with Windows Education 10 or Windows Education 11 operating system installed, projector. Software: Microsoft Office LTSC Professional Plus 2021 and Microsoft Office LTSC Professional Plus 2024 programs, Internet access.

Studying the academic discipline requires the use of special software applications, in addition to commonly used programs and operating systems - and the Android integrated development environment Studio. All of the software products listed are free or available to students under academic licenses.

13. Recommended literature:

Main

1. Murphy, M. L. Exploring Android. FINAL Edition [Electronic resource]. – CommonsWare, 2020. – Available at: https://commonsware.com/AndExplore/AndExplore-FINAL.pdf (accessed 06 October 2025).

2. Murphy, M. L. Elements of Android R. FINAL Version [Electronic resource]. – CommonsWare, 2021 (to be released under Creative Commons Attribution-ShareAlike 4.0 license on 01 Nov 2024). – Available at: https://commonsware.com/R/R-FINAL.pdf (accessed 06 October 2025).

3. Meike, G., Schiefer, L. Inside the Android OS: Building, Customizing, Managing and Operating Android System Services [Electronic resource]. – Boston: Addison-Wesley Professional, 2021. – Available at: https://ebook.app.hcu.edu.gh/wp-content/uploads/2022/05/Android-Deep-Dive-G.-Meike-Lawrence-Schiefer-Inside-the-Android-OS_-Building-Customizing-Managing-and-Operating-Android-System-Services-Addison-Wesley-Professional-2021.pdf (accessed 06 October 2025).

4. Kodeco Inc. Android Apprentice: Beginning Android Development with Kotlin. 4th Edition [Electronic resource]. – Kodeco Inc., 2021. – Available at: https://dokumen.pub/android-apprentice-fourth-edition-beginning-android-development-with-kotlin-4nbsped-1950325393-9781950325399.html (accessed 06 October 2025).

Supporting

5. ResearchGate. Developing Your First Android App: A Complete Guide for Beginners [Electronic resource]. – ResearchGate, 2024. – Available at: https://www.researchgate.net/publication/380012065_Developing_Your_First_Android_App_A_Complete_Guide_for_Beginners (accessed 06 October 2025).

6. Google Developers. Android Kotlin Fundamentals [Electronic resource]. – Android Developers, 2020. – Available at: https://developer.android.com/courses/kotlin-fundamentals/unit-2 (accessed 06 October 2025).

7. Google Developers. Android Developers: Documentation and Training [Electronic resource]. – Android Developers, 2020–2025. – Available at: https://developer.android.com/ (accessed 06 October 2025).

8. Google Developers. Jetpack Compose Tutorial [Electronic resource]. – Android Developers, 2020–2024. – Available at: https://developer.android.com/develop/ui/compose/tutorial (accessed 06 October 2025).

9. JetBrains. Kotlin Documentation [Electronic resource]. – Kotlinlang.org, 2023–2025. – Available at: https://kotlinlang.org/docs/ (accessed 06 October 2025).

14. Information resources

1. Modular learning environment. URL: https://msn.khmnu.edu.ua/course/view.php?id=6922
2. University electronic library. URL: http://library.khmnu.edu.ua/
3. KhNU Repository. URL: https://elar.khmnu.edu.ua/home

MOBILE ANDROID APPLICATION DESIGN

Discipline Status	Selective
Level of Higher Education	First (bachelor's)
Language of Instruction	English
Семестр	–
Discipline Volume, ECTS Credits	8,0
Forms of education for which the discipline is taught	Full-time (day)

Learning results. After studying the discipline, the student must know the principles of building Android applications, the component life cycle, tools for creating a user interface, working with events, databases, the network and multimedia; have practical skills in working with Android Studio, Java and Kotlin languages, asynchronous processing tools, Retrofit, ExoPlayer and Google Maps API libraries; be able to design, develop, test and optimize mobile applications; make a reasoned choice of technologies and tools; demonstrate the ability to self-study, work in a team and make effective engineering decisions.

Content of the academic discipline. Using Java and Kotlin for developments mobile applications. Graphic interface user mobile applications, elements markup. Adapters and lists, creation multi-page mobile applications. Work mobile applications with bases data SQLite. Parsers, multithreading and asynchrony. Services, broadcast message. Work mobile applications with multimedia. Work mobile applications with Google Maps.

Planned learning activities: The minimum amount of study hours in one ECTS credit of an academic discipline for the first (bachelor's) level of higher education in full-time education is 10 hours per 1 ECTS credit.

Forms (methods) of learning: lectures (using visualization methods, problem-based and interactive learning, motivational techniques, information and communication technologies); practical classes (using instruction, demonstration, solving typical and applied problems, case analysis, situational tasks, discussion elements, etc.); independent work (studying theoretical material, preparing for practical work, current and final control, performing individual and homework), using information and computer technologies and distance learning technologies.

Forms of assessment of learning outcomes: laboratory work, current control work, presentation of the results of individual tasks.

Type of semester control: credit.

Educational resources:

1. Murphy, M. L. Exploring Android. FINAL Edition [Electronic resource]. – CommonsWare, 2020. – Available at: https://commonsware.com/AndExplore/AndExplore-FINAL.pdf (accessed 06 October 2025).
2. Murphy, M. L. Elements of Android R. FINAL Version [Electronic resource]. – CommonsWare, 2021 (to be released under Creative Commons Attribution-ShareAlike 4.0 license on 01 Nov 2024). – Available at: https://commonsware.com/R/R-FINAL.pdf (accessed 06 October 2025).
3. Meike, G., Schiefer, L. Inside the Android OS: Building, Customizing, Managing and Operating Android System Services [Electronic resource]. – Boston: Addison-Wesley Professional, 2021. – Available at: https://ebook.app.hcu.edu.gh/wp-content/uploads/2022/05/Android-Deep-Dive-G.-Meike-Lawrence-Schiefer-Inside-the-Android-OS_-Building-Customizing-Managing-and-Operating-Android-System-Services-Addison-Wesley-Professional-2021.pdf (accessed 06 October 2025).
4. Kodeco Inc. Android Apprentice: Beginning Android Development with Kotlin. 4th Edition [Electronic resource]. – Kodeco Inc., 2021. – Available at: https://dokumen.pub/android-apprentice-fourth-edition-beginning-android-development-with-kotlin-4nbsped-1950325393-9781950325399.html (accessed 06 October 2025).
5. ResearchGate. Developing Your First Android App: A Complete Guide for Beginners [Electronic resource]. – ResearchGate, 2024. – Available at: https://www.researchgate.net/publication/380012065_Developing_Your_First_Android_App_A_Complete_Guide_for_Beginners (accessed 06 October 2025).
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