

Module/Course Syllabus
Program: COMPUTER SCIENCE
 Full-time master degree program

Course:	Advanced Android Programming
Type of the course:	elective
Course code:	I2S2.10
Year:	I
Semester:	2
Form of the degree program:	full-time
Form of classes and number of hours per semester:	60
Lecture	30
Classes	0
Laboratory	30
Project	0
Number of ECTS credits:	3
Form of assessment:	course completion assessment
Course language:	English

Course objective (CO)	
CO1	Learning the Kotlin programming language
CO2	Learning about modern methods of creating graphical user interface
CO3	Learning the principles of creating the architecture of a mobile application

Prerequisites in terms of knowledge, skills and other competencies	
1	Knowledge of object oriented programming
2	English
3	Knowledge of data structures and computer networks

Learning outcomes (LO)	
	In terms of knowledge:
LO 1	Student knows most important elements of the Kotlin programming language
LO 2	Student can characterize the architecture of a modern mobile application
LO 3	Student knows modern methods of creating graphical user interface
	In terms of skills:
LO 4	Student can design and implement a mobile application with an architecture that allows for easy maintenance and development of the application
LO 5	Student can create user interfaces using various methods
	In terms of social competence:
LO 6	Student is aware of the dynamic development of mobile technologies and understands the need to develop and update his/her knowledge

Course content	
Form of classes – lectures (L)	
	Course content
L1	Introduction to the Kotlin language - syntax, type system, expressions, operators, functions
L2	Kotlin classes and interfaces - syntax, inheritance, extension methods

L3	Asynchronous programming in Kotlin with the use of coroutines
L4	Methods for creating a user interface in Android
L5	Navigation within the application- navigation graph, graph traversal, passing parameters
L6	App architecture - introduction
L7	App architecture - state management, lifecycle support
L8	App architecture - data presentation - view binding and data binding
L9	App architecture - data storage
L10	App architecture - background tasks execution management
L11	Dependency injection in Android
L12	Creating tests for mobile applications
Form of classes – laboratories (Lab)	
	Course content
Lab1	Introduction to the Kotlin language - syntax, expressions, functions, classes, interfaces
Lab2	Creating a graphical user interface, navigation within the application, state management
Lab3	Data storage and presentation
Lab4	Performing background tasks, dependency injection
Lab5	Creating tests for mobile applications

Didactic methods	
1	<i>Informative and problematic lecture with multimedia presentations</i>
2	<i>Laboratory exercises: creating mobile applications</i>

Assessment methods and criteria		
Assessment method symbol	Assessment method description	Passing threshold
A1	Assessment of applications created by students during laboratories	51%
A2	A test with closed questions	51%

Required textbooks and other course materials	
1	Kotlin language specification, version 1.6-rc0.1, Marat Akhin Mikhail Belyaev (https://kotlinlang.org/spec/)
2	Effective Kotlin: Best practices, Marcin Moskała, 2019
3	Website: https://kotlinlang.org/
4	Website: https://developer.android.com
5	Kickstart Modern Android Development with Jetpack and Kotlin, Catalin Ghita, Packt Publishing, 2022
Recommended textbooks and other course materials	
1	Java and Kotlin code performance in selected web frameworks, Grzegorz Bujnowski, Jakub Smółka, JCSI - Journal of Computer Sciences Institute.- 2020, vol. 16, s. 219-226
2	Analysis of the development Android's runtime, Kostiantyn Honcharenko, Jakub Smółka, JCSI - Journal of Computer Sciences Institute.- 2019, vol. 12, s. 246-251

Student workload	
Form of activity	Average number of hours to complete the activity
Contact hours with the lecturer, including:	60
<i>participation in lectures</i>	30
<i>participation in laboratories</i>	30

Student's own work, including:	15
<i>preparation for the exam</i>	5
<i>preparation for the laboratory</i>	10
Total student workload	75
Total number of ECTS credits	3

Learning outcomes matrix					
Learning outcome	Reference to learning outcomes defined for the masters program	Course objectives	Course content	Didactic methods	Assessment methods
LO 1	I2A_W01 ++	CO1	L1 - L3	1	O2
LO 2	I2A_W02 + I2A_W07 +++	CO3	L6 - L12	1	O2
LO 3	I2A_W01 ++ I2A_W08 +++	CO2	L4, L5	1	O2
LO 4	I2A_U09 + I2A_U13 +++	CO3	Lab1 - Lab5	2	O1
LO 5	I2A_U15+++	CO2	Lab2	2	O1
LO 6	I2A_K01 + I2A_K02 +	CO1, CO2, CO3	L1 - L12 Lab1 - Lab5	1, 2	O1, O2

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