GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mobile Operating Systems, PG_00053913						
Field of study	Informatics						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2026/2027			
Education level	first-cycle studies		Subject group	Optional subject group Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	3		Language of instruction	Polish			
Semester of study	6		ECTS credits	3.0			
Learning profile	general academic profile		Assessment form	exam			
Conducting unit	Department of Geoinformatics -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marek Kulawiak					
	Teachers	dr inż. Marek Kulawiak					
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours	Self-study		SUM
	Number of study hours	30		4.0	41.0		75
Subject objectives	The course discusses the components of the system software (operating system) running on mobile devices (smartphone/tablet). The subject is concentrated mainly around Android. Android is an open source system, which allows for a detailed discussion and study of the examples which demonstrate solutions that were used in the construction of the system. Discussed are all key layers of Android operating system - from bootloaders via kernel (Linux), ending with applications created by users themselves (Kotlin).						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study and perform tasks, in an innovative way, in not entirely predictable conditions, by:n- appropriate selection of sources and information obtained from them, assessment, critical analysis and synthesis of this information,n- selection and application of appropriate methods and toolsn	The student is able to program an application using standard libraries.	[SU4] Assessment of ability to use methods and tools
[K6_U02] can perform tasks related to the field of study in an innovative way as well as solve complex and nontypical problems, applying knowledge of physics, in changing and not fully predictable conditions	The student is able to use different programming platforms and environments in order to develop specialized applications.	[SU3] Assessment of ability to use knowledge gained from the subject
[K6_W11] knows and understands to an advanced degree the general principles of the creation and development of economic entities, forms of individual entrepreneurship and conducting enterprises and the fundamental dilemmas of modern civilization, as well as the basic economic, legal and other conditions of various types of activities related to the field of study, including the basic concepts and principles of industrial property protection and copyright law	The student knows the architecture of popular operating systems, as well as tools for their development and maintenance.	[SW1] Assessment of factual knowledge

Subject contents

Course content – lecture
History and comparison of mobile operating systems.
Hardware Platforms (CPU) for mobile systems.
Architecture of an open mobile system.
Boot Sequence - from bootloader to user applications.
Kernel structure and architecture.
Elements of userspace environment in a mobile system.
Mechanisms for sharing mobile system memory.
Native development in Android.
The virtual machines in mobile systems (on the example of ART).
Frameworks application development for mobile systems.

Course content – laboratory
Introduction to Android development.
Data exchange between applications.
File access methods.
Android services.
Native programming

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Laboratory	60.0%	50.0%
Exam	60.0%	50.0%

Recommended reading

Basic literature	Lecture notes, slides and laboratory instructions.
Supplementary literature	Karim Yaghmour. 2013. *Embedded Android: Porting, Extending, and Customizing* (1st ed.). O'Reilly Media, Inc. Ian F. Darwin. 2012. *Android Cookbook*. O'Reilly Media, Inc.
eResources addresses	

Example issues/ example questions/ tasks being completed

Android system architecture.
Application development with a graphical user interface.
Programming the main components of the application on Android.
What is the role of AndroidManifest.xml?
What are the features of ART VM?

Practical activites within the subject

Not applicable

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