



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mobile applications

### Course

Field of study

Computing

Area of study (specialization)

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

16

Laboratory classes

16

Other (e.g. online)

0

Tutorials

0

Projects/seminars

8

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

dr hab. Marek Mika

Responsible for the course/lecturer:

Bartosz Zgrzeba MSc

### Prerequisites

A student beginning this course should have knowledge of the basics of using mobile devices and imperative programming (gained during the classes in the subject Programming basics) and selected elements of wireless computer networks. He or she should have the ability to implement simple algorithms, assess their complexity and acquire knowledge individually from the selected sources.

### Course objective

Providing students with basic knowledge about the specifics and principles of mobile application design. To develop students' ability to specify requirements concerning mobile application, proper selection of programming tools and techniques of testing the created application. Developing in students the skills of teamwork during the project implementation during laboratory classes.

### Course-related learning outcomes

Knowledge

1. Structured and theory-based general knowledge of mobile applications and detailed knowledge of mobile application states.



2. Knowledge of important directions of development and the most important achievements of IT in the field of mobile applications.
3. Knowledge of basic techniques, methods and tools used in the process of solving IT tasks in the field of mobile applications, mainly of an engineering nature.
4. Structured, theoretically based general knowledge of mobile systems architecture and mobile operating systems.

#### Skills

1. The student is able to obtain information on mobile applications from literature, hardware specifications and other sources (in his/her native language and English), integrate them, interpret and critically evaluate them.
2. The student is able to adequately use information and communication techniques (including free multimedia courses) applied at various stages of mobile application development.
3. The student is able to apply appropriate tools simulating the operation of a mobile device when formulating and solving IT tasks in the field of mobile applications.
4. The student is able to design, formulate functional specifications in the form of use cases, formulate non-functional requirements and implement a mobile application by choosing a proper programming language and using appropriate methods and techniques
5. The student has the ability to formulate algorithms and implement them using at least one of the popular development environments used to implement mobile applications.

#### Social competences

1. The student understands that knowledge and skills in the field of mobile applications rapidly become obsolete
2. The student is aware of the importance of knowledge of mobile applications in solving engineering problems and knows examples and understands the causes of malfunctioning IT systems.

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Summary evaluation: a) assessment of knowledge and skills acquired during the lectures is made on the basis of the realized project of the mobile application b) in the field of laboratories the verification of the assumed educational results is made by: evaluation of partial tasks carried out during the classes.

Additionally, students' activity during the classes is rewarded: preparation of a study on a specific topic, discussion of additional aspects of the issue, formulation of comments affecting the improvement of teaching materials, informing the teacher about difficulties in understanding the material taught. For students with advanced knowledge and skills in the field of the subject, it is possible to pass it in an alternative way: by preparing a presentation for the lecture and making a mobile application according to the specification prepared by the laboratory teacher.



## Programme content

Lecture: fundamentals and specifics of mobile systems, mobile device positioning systems, methods of communication of mobile systems, fundamentals of mobile devices architecture, fundamentals of mobile operating systems, classification of mobile applications (web, native and hybrid applications), idea of Responsive Web Design, environments for designing hybrid mobile applications, design and characteristics of Android, life cycle of applications in Android, basic components of applications in Android, tools for designing mobile applications in Android. Ways of using selected hardware resources of a mobile device in the Android system. Use of cloud resources in mobile applications. Distribution of own applications for Android.

Laboratory exercises: creation of web-based mobile applications (idea Responsive Web Design based on CSS Media Query), programming of hybrid mobile applications in a selected programming environment, visual programming of mobile applications (MIT AppInventor), basics of the Basin language and selected mobile application development environment for Android. Using selected APIs in network and hardware interfaces of mobile applications.

Project: preparation of specification of own project proposal taking into account the specifics of mobile devices, project realization, preparation of project realization report.

## Teaching methods

Lecture: multimedia presentation, examples of "live" creating applications.

Laboratory exercises: multimedia presentation, performing tasks according to the specification indicated by the instructor - practical exercises.

Project: realization of the project according to the rules of software engineering.

## Bibliography

### Basic

1. Wydajne aplikacje dla systemu Android : programuj szybko i efektywnie, Sillars D., Helion 2017
2. Android : programowanie aplikacji / Dawn Griffiths, David Griffiths, Helion 2016

### Additional

1. Android : aplikacje wielowątkowe, techniki przetwarzania, Göransson A., Helion 2015
2. Android, Deitel P.J., Deitel H.M., Wald A., Matuk, K. Helion 2016. Bilans nakładu pracy przeciętnego studenta



### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	40	1,5
Student's own work (literature studies, preparation for laboratory classes, project implementation, preparation of specification and report on project implementation) <sup>1</sup>	60	2,5

<sup>1</sup> delete or add other activities as appropriate