# POZNAN UNIVERSITY OF TECHNOLOGY

## EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

## COURSE DESCRIPTION CARD - SYLLABUS

Course name
Mobile Application Development with AI Elements [S2SI1E>PAM]

## Course

Field of study
Artificial Intelligence

Year/Semester
1/2

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

## Number of hours

Lecture
30

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
15

## Number of credit points
4,00

## Coordinators

dr inż. Bartłomiej Prędki
bartlomiej.predki@put.poznan.pl

## Lecturers

## Prerequisites

Student should have knowledge concerning the way the computer works, imperative programming (obtained in earlier courses), the basics of computer networks and artifial intelligence. Should be able to solve basic problems in computing, especially in user interface design and application of specific algorithms. Student should understand the need to expand his competence and be ready to partake in group activities. Besides, student should have basic social competence like honesty, responsibility, persistence, curiosity and creativity, respect for others.

## Course objective

Course objectives: 1. Students should obtain knowledge concerning the history of mobile computer systems. 2. Students should know the difference between mobile and desktop/web applications design. 3. Students should be able to design and program a mobile application for iOS and Android systems. 4. Students should have knowledge and experience in implementing mobile applications using client/server architecture. 5. Students should enhance their ability to work in teams.

## Course-related learning outcomes

Knowledge 1. Student has a structured and well grounded knwoledge of mobile systems and mobile

application development.
2. Student has konwledge of current developments and trends in mobile systems.
3. Student knows basic techniques, methods and tools used to solve problems associated with mobile application design.
4. Student knows how to include Machine Learning approaches into mobile applications.
5. Student has a structured knowledge of computer architectures and operating systems.
Skills 1. Student can search for information concerning mobile systems and applications in literature, data bases and other sources, integrate it and formulate opinion.
2. Student is able to use information-communication techniques while solving problems in system design, especially in mobile systems.
3. Student is able to choose and apply adequate methods considering mobile application development.
4. Student can design a mobile application, choose an appropriate programming language and environment.
5. Student can formulate algorithms and implement them using one of the dominating mobile application development languages (Swift and Kotlin).
6. Student can correctly use the chosen method of estimating the labor consumption of software development, with the emphasis on the artificial intelligence methods
7. Student can plan his/her own development and can see need for constant dicscovery of new knowledge.
Social competences 1. Student knows, that skills and knowledge can quickly become obsolete.
2. Student is aware of knowledge importance in solving of engineering problems and knows the dangers of bad design and computer system malfunctions.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Presented outomes are verified as follows:
Forming degree:
a) on lectures - based on the answers concerning material presented on previous lectures;
b) on laboratories and projects - based on the fullfilment of current tasks and implementation of projects,
Summary degree:
- verification of skills used in laboratory excersises,
- constant verification in classes - verification of knowledge and skill acquisition,
- written test consisting of 10-15 questions; to pass the test studet has to obtain at least 50% of correct answers.
Additional point obtained in classes, especially:
- demonstration of interesting extraculicular competences,
- presentation of additional problem aspects,
- doing a presentation on interesting subject concerning ubiqituous systems,
- efficacy of obtained knowledge use while solving a problem,
- ability to work in team,
- useful remarks concerning teaching materials.

## Programme content

The course presents the problems of developing mobile applications for iOS and Android with practical examples illustrating selected techniques.

## Course topics

Following subjects are presented on lectures:
- introduction to Swift language,
- programming for iOS and iPadOS using Xcode IDE,
- basics of Kotlin language,
- programming for Android using Android Studio
- programming using different API's,
- using Cloud services,
- using ML models in mobile applications,
- data exchange protocols, e.g. JSON, REST,
- In laboratories student are trying to solve in practice tasks presented in lectures as a series of mini projects; as a project students will implement a sample closed project for the chosen platform.

## Teaching methods

1. Lecture: multimedia prsentation, discussion, demonstration.
2. Laboratories: doing tasks, team work, design and implementation of sample problems.
3. ProjectL students individually develop a mobile application

## Bibliography

1. iOS 5: programowanie: receptury / Vandad Nahavandipoor ; [tł.: Robert Górczyński], Helion 2013.
2. Tworzenie aplikacji na platformę iOS 5 : z wykorzystaniem Xcode, Interface Builder, Instruments, GDB oraz innych kluczowych narzędzi, Brandon Alexander, J. Bradford Dillon, Kevin Y. Kim, Helion, 2012
3. Objective-C : praktyczny podręcznik tworzenia aplikacji na systemy iOS i Mac OS X!,Stephen G. Kochan, Helion 2012
4. Podstawy języka Swift: programowanie aplikacji dla platformy iOS / Mark A. Lassoff & Tom Stachowitz, Helion 2016
5. Service design patterns: fundamental design solutions for SOAP/WSDL and RESTful Web services, Robert Daigneau, Addison-Wesley, 2012
6. Inteligentny dom: automatyzacja mieszkania za pomocą platformy Arduino, systemu Android i zwykłego komputera / Mike Riley, Helion 2013
7. Android : programowanie aplikacji / Dawn Griffiths, David Griffiths, Helion 2016

## Breakdown of average student's workload

|  | Hours | ECTS |
|---|---|---|
| Total workload | 100 | 4,00 |
| Classes requiring direct contact with the teacher | 60 | 2,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 40 | 2,00 |