COURSE DESCRIPTION CARD - SYLLABUS

Course name
Programming of mobile devices - iOS [S1MiKC1E>PniOS]

Course

Field of study
Microelectronics and Digital Communication

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
English

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
15

Number of credit points

4,00

Coordinators

dr inż. Paweł Sroka
pawel.sroka@put.poznan.pl

Lecturers

Prerequisites

Student starting this course should have knowledge in computer science and object-oriented programming, particularly knowing syntax of various programming languages such as: C++ or C# or Java. Moreover, students should know the fundamentals of the functioning of the operating systems and databases, and have deepened knowledge of current available communication systems. Furthermore, students should be able to implement advanced algorithms using selected programming languages, be able to find the required solutions for identified problems in different sources and be prepared to work in group. Students should be also aware of their limitations and skills and the need to pursue with their education. Finally, they should understand the need for professional treatment of the problems and their responsibility for developed solutions

Course objective

The main goal of the course is to develop student's knowledge and skills in programming of mobile devices with iOS operating system. After completing the course students will be able to implement their own application with different functionality using rich resources and tools, test it and, finally, they will know how to prepare it for publication on the Internet market.

Course-related learning outcomes

Knowledge:
1. Has ground knowledge in the area of programming of mobile devices with iOS.
2. Has knowledge about the possibilities of usage of various modules and resources available in nowadays mobile devices with iOS.
3. Knows how to use the additional tools and libraries to extend the functionality of the implemented application for iOS devices.

Skills:
1. Possesses the skills of using various resources and tools available on the Internet to develop iOS applications.
2. Is able to prepare the complete iOS application together with the required documentation.
3. Is able to verify the application implementation correctness using testing mechanisms.

Social competences:
1. Understands the need to further extend the knowledge about development and usage of iOS applications; is aware that the knowledge and skills in this area evolve quickly.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired in the lectures is verified in the form of a written exam. The written exam comprises 6-10 questions that are graded (with points) differently. The written exam is passed if at least 50% of the total score is obtained.
The abilities acquired during the laboratories are verified with 4-7 exercises covering the topics introduced during lectures and described in the laboratory instructions. Each exercise is based on implementation of application and its certain features and might be graded differently (with points) depending on the difficulty and the required work effort. The evaluation is performed based on the written report describing the implemented application and the observed involvement of the student into work. The final grade depends on the number of collected points, with a positive result achieved if at least 50% of the maximum number of points is obtained.
Skills and competences acquired during the project classes are evaluated based on the realization of a large task - a project - relying on the implementation of an advanced application for iOS, with the topic and scope of work agreed with the student. Projects might be realized individually or in groups comprising at most 3 persons. The final evaluation for the project task, graded between 2 and 5, depends on the level of difficulty of the task, completed modules/functionalities and the involvement of student into work.

Programme content

This course introduces the theoretical and practical aspects of design and implementation of applications for mobile devices with iOS. Among the considered topics, the notable ones are: design and implementation of user interface, data management or use of different tools and libraries to extend the functionality of applications. iOS application testing methods are also discussed.

Course topics

Lectures comprise the following topics:
1. Introduction to iOS programming and Swift language (2 h).
2. iOS application lifecycle (1 h).
3. Design of graphical user interface for iOS applications (2 h).
4. Adaptive interface design and handling gestures (3 h).
5. Persistent data storage in iOS (3 h).
6. Application testing in iOS (1 h).
7. Other aspects of iOS applications: concurrency and multithreading, notifications, use of location information and maps, networking (3 h).
The following topics are taught in the laboratories:
1. Creating a basic iOS application. Introduction to graphics (4 h).
2. Implementation of multi-screen application (6 h).
3. Implementation of adaptive user interface and gestures handling (6 h).
4. Persistent data storage (2 h).

5. iOS application testing: unit and integration tests (4 h).
6. Networking and other tools in iOS (8 h).
Project topics cover the development of multi-screen iOS application with adaptive user interface, making use of advanced iOS libraries and frameworks (e.g. persistent storage, use of maps, etc.). The implemented application is verified using a simulator of a physical iOS device. The total workload of the project task is 15 h.

Teaching methods

Lecture: multimedia presentation with tutorial-style classes also possible.
Laboratories: laboratory exercises - students develop iOS applications with specific features, according to the provided laboratory instructions, on Apple computers equipped with iOS device simulator.
Project: Realization of the project task - design and implementation of an application with specific functionality using the Apple computers equipped with the needed software and iOS simulator and, eventually, additional tools available on the Internet. The project tasks may be realized in groups

Bibliography

Basic:
Mark A. Lassoff, Tom Stachowitz (tł. Robert Górczyński), "Podstawy języka Swift : programowanie aplikacji dla platformy iOS",Helion, 2016.
Matt Neuburg (tł. Robert Górczyński), "iOS 12 : wprowadzenie do programowania w Swifcie", Helion, 2019.

Additional:
N.Smyth, "iOS 10 App Development Essentials", CreateSpace Independent Publishing Platform, 2016
https://developer.apple.com (online)

Breakdown of average student's workload

	Hours	ECTS
Total workload	120	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)	60	2,00