Mobile Applications

Academic Year: (2021 / 2022)   **Review date: 09-11-2021**

Department assigned to the subject: Telematic Engineering Department

Coordinating teacher: GARCIA GUTIERREZ, BONI

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)
Programming
Data structures and algorithms
Data Base
Web Applications

OBJECTIVES
The objective of this course is that the student knows the principles of design and development of applications for mobile terminals and use them to capture data from them. Mobile terminals are characterized by their limitations compared to conventional computers, both in terms of processing capacity and memory, user interface and power consumption, as well as the use of wireless communication interfaces, both personal and local area or of wide area.

When taking the course, the student will acquire the following skills:

- Know the particular characteristics of mobile applications.
- Perform prototyping of mobile applications.
- Design and program applications in some of the most common platforms for mobile applications: Android.
- Handle and use with ease the different software tools for the development of mobile applications.
- Use mobile terminals to validate the developments made and capture data.
- Work in a team effectively in the development of complete applications.
- Learn autonomously.

The student will develop the following abilities:

- Ability to apply knowledge of data engineering, specifically those related to the development of mobile applications.
- Ability to design and carry out experiments, as well as to organize, analyze and interpret the obtained data. This capacity will be worked on in laboratory practices.
- Ability to communicate effectively both orally and in writing. Students will have to defend their practice through an oral presentation, and deliver associated documentation.
- Knowledge of current issues. Students will work with the latest operating systems and perform their mobile terminal practices to validate the developments made.
- Ability to use modern engineering techniques, skills and tools necessary for the practice of engineering. Students will use different software tools for the development of mobile applications, and mobile terminals to validate their practical developments.
- Ability to develop mobile applications and use them to capture data with them.

The competences that the student will acquire are:

CB1: That students have demonstrated to possess and understand knowledge in an area of ¿¿study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that they imply knowledge coming from the vanguard of their field of study.
CB2: That students know how to apply their knowledge to their work or vocation in a professional manner and have the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of ¿¿study
CE19: Ability to develop Web and mobile applications and use them to capture data with them.
CG3: Ability to solve problems with initiative, decision making, creativity, and to communicate and

transmit knowledge, skills and abilities, understanding the ethical, social and professional responsibility of the data processing activity. Leadership, innovation and entrepreneurial spirit.
CG4: Ability to solve technological, computer, mathematical and statistical problems that may arise in engineering and data science.
CT1: Ability to communicate knowledge orally and in writing, before a specialized and non-specialized public.

The learning outcomes:

RA1 Have acquired advanced knowledge and demonstrated an understanding of the theoretical and practical aspects and the methodology of work in the field of science and data engineering with a depth that reaches the forefront of knowledge
RA2 Power, through arguments or procedures developed and supported by them, apply their knowledge, understanding of these and their problem solving abilities in complex or professional and specialized work environments that require the use of creative and innovative ideas
RA3 Have the ability to collect and interpret data and information on which to base their conclusions, including, when necessary and pertinent, reflection on matters of a social, scientific or ethical nature within the scope of their field of study;
RA6 Be able to identify their own training needs in their field of study and work or professional environment and to organize their own learning with a high degree of autonomy in all types of contexts (structured or not).

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
1.1 Operating systems for mobile devices
1.2 Mobile applications development general concepts
2. Mobile applications design
2.1 User interfaces
2.2 Communication between application components
2.3 Data storage: files, databases
2.4 Background services
2.5 Acquisition and management of location data
2.6 Acquisition and management of sensor data (accelerometer, gyroscope, digital compass, light, proximity, etc.)
2.7 Acquisition and management of multimedia data (microphone, camera)
2.8 Acquisition and management of network data (WiFi, Bluetooth, telephony)
3. Mobile application project

LEARNING ACTIVITIES AND METHODOLOGY

The following training activities will be used:

AF1: THEORETICAL-PRACTICAL CLASSES. They will present the knowledge that students should acquire. They will receive the class notes and will have basic texts of reference to facilitate the follow-up of the classes and the development of the subsequent work. Exercises, practical problems on the part of the student will be solved and workshops and evaluation test will be held to acquire the necessary skills.
AF2: TUTORIES
AF3: INDIVIDUAL OR GROUP WORK OF THE STUDENT.
AF8: WORK IN LABORATORIES.
AF9: FINAL EXAM. In which the knowledge, skills and abilities acquired throughout the course will be assessed globally.

The following methodology will be used:

MD1: CLASS THEORY. Exhibitions in the teacher's class with support of computer and audiovisual media, in which the main concepts of the subject are developed and the materials and bibliography are provided to complement the students' learning.
MD2: PRACTICES. Resolution of practical cases, problems, etc. raised by the teacher individually or in groups.
MD3: TUTORIALS. Individualized assistance (individual tutorials) or group (collective tutorials) to students by the teacher.
MD6: LABORATORY PRACTICES. Teaching applied in laboratories under the supervision of a tutor.

ASSESSMENT SYSTEM

SE2: CONTINUOUS EVALUATION. In it, work, presentations, debates, exhibitions in class, exercises, practices and laboratory work throughout the course will be evaluated.

The continuous evaluation will be based on the following criteria:

- Resolution of practices: 70%. The practices carried out in laboratory classes will be evaluated. Students will develop team projects that will consist of the design and development of mobile applications, in which they must apply the knowledge and skills acquired in the subject. The students will have to make a written documentation and an oral presentation of the work done. Students will make prototypes of applications using current software tools and validate their operation in next-generation mobile devices.

- Written exam: 30%. The theoretical and practical knowledge acquired by the student will be evaluated through an examination. A minimum grade of 4.0 out of 10 must be obtained in this part in order to pass the subject.

If the student does not follow the continuous evaluation, the final exam will have a value of 60% in the ordinary call and 100% in the extraordinary call.

% end-of-term-examination:	0
% of continuous assessment (assigments, laboratory, practicals…):	100

BASIC BIBLIOGRAPHY
- Reto Meier Professional Android 4th Edition, Wiley, 2018

BASIC ELECTRONIC RESOURCES
- Google . Training Android Developers: http://developer.android.com/training/index.html

- Google . Guides Android Developers: https://developer.android.com/guide/

- Google Developer Training Team . Advanced Android Development: https://developers.google.com/training/courses/android-advanced
- Google Developer Training Team . Android Developer Fundamentals Course: https://developer.android.com/courses/fundamentals-training/overview-v2