1. BASIC INFORMATION

Course	Mobile Development
Degree program	Grado en Ingeniería Informática
School	Architecture, Engineering and Design
Year	3º
ECTS	6 ECTS
Credit type	Optional
Language(s)	Spanish / English
Delivery mode	On-site / On-line
Semester	S5
Academic year	2025-2026
Coordinatin professor	Dr. Miquel Angel Colobran Huguet

2. PRESENTATION

"Development for mobile devices" is an optional subject of 6 ECTS credits within the knowledge area of "Programming" made up of 42 ECTS credits where 6 credits are optional.

This subject aims to provide the student with the basic concepts and guidelines for the development of mobile applications, starting with knowing the particularities of them and the different existing approaches to carry them out.

Students of the Bachelor's Degree in Computer Science will take advantage of the knowledge obtained in previous subjects on interface design techniques, software engineering and programming languages. Mobile devices of any kind such as smartphones, tablets or *wearable devices* offer unique features compared to other types of platforms, both because they are equipped with more sensors (GPS, camera, accelerometers, heart rate monitors, etc.) and because they are conditioned by graphic interfaces and ways of using them that are very different from other development platforms.

The student will learn how to design mobile applications that consider these particularities and, especially, what dev tools or environments can be used. From the adaptation of already known web development platforms to native development environments for the two current dominant operating systems: Android and iOS.

3. LEARNING OUTCOMES

KNOWLEDGES

CON15 Knowledge and application of the necessary tools for storage, processing, and access to information systems, including web-based systems.

SKILLS

HAB03 Ability to design, develop, select, and evaluate computer applications and systems, ensuring their reliability, security, and quality in accordance with ethical principles and current legislation and regulations.

COMPETENCIES

CP03 Ability to design, develop, evaluate, and ensure the accessibility, ergonomics, usability, and security of computer systems, services, and applications, as well as the information they manage.

Specific learning outcomes for the subject

Subject-Specific Knowledge

- Understand the specificities of mobile applications.
- Recognize the characteristics and capabilities of native applications compared to hybrid or web-based applications.

Subject-Specific Skills

- Prototype mobile applications.
- Use the Environments and tools for mobile application development
- Design and program (native) mobile applications on Android.
- Develop an app on iOS

4. CONTENTS

- Basic characteristics of mobile applications.
- Introduction to design and development for mobile devices.
- Cross-platform application development: Techniques and tools for creating applications that work on multiple mobile operating systems.
- Development tools. Resources and services: Use of frameworks, tools, development environments, and other resources and services that can be integrated into mobile applications.
- Native development: Development of native applications for the two main mobile platforms: Android and iOS.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- **Survey of objectives and interests.** It is used to establish the objectives of the subject, gather the student's interests in it, and then refer throughout the course so that the group of students can assess the achievement of those objectives and interests. In the virtual modality, an initial questionnaire is carried out with this same objective.

- **Master class, study topics and seminars.** The so-called "master classes" in the face-to-face modality, in virtual mode can be called topics of study and seminars, and are carried out through the reading of topics, technical notes and seminars using web conferences (which are recorded to be accessed by students).

- **Project-Based Learning (PBL):** Students work in groups to solve a real-world problem or challenge throughout the course. This allows them to gain knowledge and skills through research, design, and creating a tangible solution. This methodology encourages collaboration and teamwork to address research topics or solve specific problems.

- **Laboratory practices.** While in the face-to-face modality, the campus laboratories are mainly used, while in the virtual modality, the remote station infrastructure is used.

- **Designs understood as practical proposals for the elaboration of solutions applied to specific problems.** Used in all teaching modalities, they serve to develop creative potential and technical skills in the field of engineering.

- **Field experiences, conferences, visits to companies and institutions**. They will be used for the development of conditional knowledge. In face-to-face mode, all of them can be held, while in virtual mode, only attendance at conferences can be done, since they will be available remotely live (through streaming technologies) or recorded and broadcast later.

6. LEARNING ACTIVITIES

The following table shows, for each learning activity: ***i***) the total time the student will spend, ***ii***) the time distribution between in-class and off-class time, and ***iii***) the course policy about the use of artificial intelligence (AI) in that activity.

Face-to-face modality:

Learning activity	Number of hours	Face-to-face hours	Use of AI
Master classes	12	12	Suggested
Practical application master classes	10	16	Suggested
Preparation of reports and writings	25	10	Suggested
Research and projects	15	8	Suggested
Oral presentation of activities	12	4	Suggested
Activities in workshops and/or laboratories	5	4	Not permitted
Self-studying	65	0	Not permitted
Debates and colloquia	4	4	Not permitted
On-site assessment tests	2	2	Not permitted
TOTAL	150 hours	60 hours (40%)	

Online modality:

Learning activity	Number of hours	Synchronous hours	Use of AI
Multimedia teaching resources	25	0	Suggested
Reporting	10	0	Suggested
Project development	40	0	Suggested
Study of contents and complementary documentation (Self-studying)	65		Suggested
Oral presentations	4	0	Suggested
Virtual forum	4	0	Not permitted
Virtual assessment tests	2	0	Not permitted
TOTAL	150 hours	0 horas	

7. ASSESSMENT

The evaluation systems are listed below, as well as their weight on the total grade of the subject:

Face-to-face modality:

Evaluation system	Weight
Face-to-face assessment tests	25
Oral presentations	10
Reports and writings	25
Performance evaluation	10
Research and projects	30

Online modality:

Evaluation system	Weight
Virtual assessment tests	20
Oral presentation	10
Reports	20
Performance evaluation	10
Project development	30
Virtual Lab/Workshop Practice Notebook	10

On the Virtual Campus, when you access the subject, you will be able to consult the evaluation activities you must carry out, as well as the delivery dates and evaluation procedures for each of them.

7.1. First exam period

In order to pass the course in the first exam period, you must:

- Obtain a final course grade of at least 5.0 (included) out of 10.0 (weighted average).
- In any case, it will be necessary for you to obtain a grade greater than or equal to 5.0 in all the evaluation tests/checkpoints, so that it can average with the rest of the activities. If you do not reach 5.0 in any of them, the grade may not exceed 4.0

- The teacher reserves the right to request an additional test to any of the evaluation tests, in the event of doubts about the student's authorship.
- Attend at least 60% of the lectures, with the exception of some special cases included in the School regulations.

7.2. Second exam period

Students who do not pass the course during the normal assessment period will have a second chance to retake the course in the Supplementary Exam Period. The same requirements and assessment rules mentioned in the previous section (regular assessment period) are also held in this period, with the exception of the attendance requirement.

The activities not delivered or not passed in the ordinary call must be submitted before the date of supplementary exam period (the maximum date to deliver them will be established by the professor through the virtual campus), after having received the corresponding feedback from the teacher.

The teacher reserves the right to request an additional test to any of the evaluation tests, in the event of doubts about the student's authorship.

8. SCHEDULE

This table shows the tentative delivery deadline for each assessable activity in the course:

Assessable activities	Deadline
Participation Activities (individual and group)	Weeks 1-18
Project Proposal Submission	Weeks 1-3
First Phase Project Submission	Weeks 7-8
Checkpoint I	Weeks 7-8
Second Phase Project Submission	Weeks 11-13
Checkpoint II	Weeks 13-14
Final Project Submission	Weeks 17-18
Project Presentation	Weeks 18-19

First exam period	Week 19

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

9. BIBLIOGRAPHY

Recommended Bibliography:

- Project Management Institute. (2021). A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Seventh Edition. Project Management Institute.
- Andreas Dormann. Ionic 7: Create awesome and AI-able apps for any platform. Julio de 2023
- John F. Clark. History of Mobile Applications. Theory and Practice of Mobile Applications -Readings and Lectures -2012
- Benjamin Bahr. Prototyping of User Interfaces for Mobile Applications. Springer. 2017
- Javier Cuello y José Vitone. Diseñando apps para móviles. Junio de 2013.www.appdesignbook.com
- Jenifer Tidwell, Charles Brewer y Aynne Valencia. Designing Interfaces: Patterns for EffectiveInteraction Design. O'Relly 2020
- Android Tutorial. https://w3points.com/android-tutorial/
- Pérez, B.P. y Lee, W.M. (2012). Android 4. Desarrollo de aplicaciones. Anaya Multimedia-AnayaInteractiva.
- Firebase Cloud Messaging. https://firebase.google.com/docs/cloud-messaging
- Apple Developer. https://developer.apple.com/
- Mastering SwiftUI Book. https://blckbirds.com/mastering-swiftui-book/

Web Resources:

- Ionic : https://ionicframework.com/
- Ionic documentation:https://ionicframework.com/docs
- Cordova documentación: https://cordova.apache.org/
- Bootstrap documentación: https://getbootstrap.com
- W3C consortium: https://www.w3.org
- w3schools consortium: https://www.w3schools.com
- PHP documentación: http://php.net
- JQuery documentación: https://jquery.com

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the

students inclusions with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by mean of counselling and personalized plans for students who need to improve their academic performance.

2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunity for all students.

3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.

4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:

orientacioneducativa@universidadeuropea.es

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.