



POLITÉCNICA

INTERNATIONAL
CAMPUS OF
EXCELLENCE

COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros
Informaticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

105000396 - Programming For Mobile Devices

DEGREE PROGRAMME

10II - Grado en Ingeniería Informática

ACADEMIC YEAR & SEMESTER

2020/21 - Semester 2

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1. Description

1.1. Subject details

Name of the subject	105000396 - Programming For Mobile Devices
No of credits	3 ECTS
Type	Optional
Academic year of the programme	Fourth year
Semester of tuition	Semester 8
Tuition period	February-June
Tuition languages	English
Degree programme	10II - Grado en Ingenieria Informatica
Centre	10 - Escuela Tecnica Superior de Ingenieros Informaticos
Academic year	2020-21

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Sergio Paraiso Medina	2306	sergio.paraiso@upm.es	Sin horario.
Raul Alonso Calvo (Subject coordinator)	2315	raul.alonso@upm.es	M - 10:00 - 13:00 W - 10:00 - 13:00

* The tutoring schedule is indicative and subject to possible changes. Please check tutoring times with the faculty member in charge.

3. Prior knowledge recommended to take the subject

3.1. Recommended (passed) subjects

- Algoritmos Y Estructura De Datos
- Programacion li
- Concurrencia
- Sistemas Orientados A Servicios

3.2. Other recommended learning outcomes

- Programming skills, and object-oriented programming
- Elementary knowledge of web programming and web services

4. Skills and learning outcomes *

4.1. Skills to be learned

CG-19 - Capacidad de usar las tecnologías de la información y la comunicación.

CG-2/CE45 - Capacidad para el aprendizaje autónomo y la actualización de conocimientos, y reconocimiento de su necesidad en el área de la informática.

CG-24/25/26/27 - Capacidad para trabajar en el contexto internacional, comunicándose en lengua inglesa y adaptándose a un nuevo entorno.

CG-6 - Capacidad de abstracción, análisis y síntesis

Ce 44 - Conocimiento de tecnologías punteras relevantes y su aplicación.

4.2. Learning outcomes

RA523 - Get familiar with techniques, technologies and processes allowing them to prototype, develop and improve digital interactive systems based on various user interface technology platforms

RA280 - Obtención de las competencias lingüísticas comunicativas (comprensión, expresión, etc.) habladas y escritas en entornos académicos/profesionales nacionales/internacionales.

RA276 - Dado un campo de aplicación de la informática, evaluar y diseñar el sistema informático más apropiado para resolver alguno de sus problemas, exponiendo las dificultades técnicas y los límites de la aplicación.

RA524 - Implement interactive android applications

RA285 - Capacitación para formar parte de un equipo de trabajo en los diferentes cargos que se le asignen. Para la Movilidad Internacional:

* The Learning Guides should reflect the Skills and Learning Outcomes in the same way as indicated in the Degree Verification Memory. For this reason, they have not been translated into English and appear in Spanish.

5. Brief description of the subject and syllabus

5.1. Brief description of the subject

This course introduces the fundamentals of programming techniques for mobile devices, more concretely to android basics development. Students will learn how to design and implement mobile applications following user interfaces design good practices, and how user interface systems are integrated with mobile operating system.

The course will focus on prototyping and development of simple graphical user interfaces (GUI) using rapid development tools such as graphical user interface layout editors combined with simple code to create functioning interfaces.

The course focuses on practice the skills needed for development of user interfaces to be deployed on Android mobile platform.

Concretely, students will learn to use technologies from mobile applications:

- Basics on GUI, such as event-driven programming, or design patterns, like Model-View-Controller (MVC).
- Basics on client-server communications and web communications.
- Android framework and development, including system interaction, application states, layout generation, basic UI components, ?.

5.2. Syllabus

1. Introduction to Android platform
2. Introduction to principles in software design and development processes
 - 2.1. Principles of object oriented programming and design techniques for GUI
 - 2.2. Interaction programming and event driven programming
3. Introduction to Android architecture
 - 3.1. Android development tools
 - 3.2. Intents and Activities
 - 3.3. Android UI layouts and components
 - 3.4. Developing UI in Android
 - 3.5. Notifications
 - 3.6. Broadcast receivers
4. Introduction to data persistence features in Android
 - 4.1. Application preferences
 - 4.2. File system
 - 4.3. SQLite

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Distant / On-line	Assessment activities
1	Introduction to Android platform Duration: 02:00 Lecture			
2	Principles of object oriented programming and design techniques for GUI Duration: 01:00 Lecture Interaction programming and event driven programming Duration: 01:00 Lecture			
3	Android development tools Duration: 00:30 Lecture	Android development tools Duration: 01:30 Laboratory assignments		
4	Intents and Activities Duration: 00:30 Lecture	Intents and Activities Duration: 01:30 Laboratory assignments		
5	Android UI layouts and components Duration: 00:30 Lecture	Android UI layouts and components Duration: 01:30 Laboratory assignments		
6	Android UI layouts and components Duration: 00:30 Lecture	Android UI layouts and components Duration: 01:30 Laboratory assignments		
7	Intents and Activities Duration: 00:30 Lecture	Intents and Activities Duration: 01:30 Laboratory assignments		
8	Developing UI in Android Duration: 00:30 Lecture	Developing UI in Android Duration: 01:30 Laboratory assignments		
9	Notifications & broadcast receivers Duration: 01:00 Lecture	Notifications & broadcast receivers Duration: 01:00 Laboratory assignments		
10	Application preferences Duration: 01:00 Lecture	Application preferences Duration: 01:00 Laboratory assignments		
11	Android File System Duration: 01:00 Lecture	Android File System Duration: 01:00 Laboratory assignments		
12	SQLite Duration: 00:30 Laboratory assignments	SQLite Duration: 00:30 Laboratory assignments		

13	Fragments Duration: 00:30 Laboratory assignments	Fragments Duration: 00:30 Laboratory assignments		
14	Permissions Duration: 00:30 Lecture	Permissions Duration: 00:30 Laboratory assignments		Application prototype Group work Continuous assessment and final examination Not Presential Duration: 15:00
15				Theoretical exam Problem-solving test Continuous assessment Presential Duration: 02:30
16				Theoretical exam Written test Final examination Presential Duration: 02:30
17				

Depending on the programme study plan, total values will be calculated according to the ECTS credit unit as 26/27 hours of student face-to-face contact and independent study time.

* The schedule is based on an a priori planning of the subject; it might be modified during the academic year, especially considering the COVID19 evolution.

7. Activities and assessment criteria

7.1. Assessment activities

7.1.1. Continuous assessment

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
14	Application prototype	Group work	No Presential	15:00	70%	5 / 10	CG-2/CE45 CG-6 CG-19 CG-24/25/26/27 Ce 44
15	Theoretical exam	Problem-solving test	Face-to-face	02:30	30%	5 / 10	CG-19 CG-24/25/26/27 Ce 44 CG-2/CE45 CG-6

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
14	Application prototype	Group work	No Presential	15:00	70%	5 / 10	CG-2/CE45 CG-6 CG-19 CG-24/25/26/27 Ce 44
16	Theoretical exam	Written test	Face-to-face	02:30	30%	5 / 10	CG-2/CE45 CG-6 CG-19 CG-24/25/26/27 Ce 44

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
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Application prototype	Group work	Face-to-face	18:00	60%	5 / 10	CG-2/CE45 CG-6 CG-19 CG-24/25/26/27 Ce 44
Theoretical exam	Written test	Face-to-face	02:00	40%	5 / 10	CG-2/CE45 CG-6 CG-19 CG-24/25/26/27 Ce 44

7.2. Assessment criteria

This course is intended to be practical. It is encouraged that pupils bring their own laptop to follow laboratory classes.

All presentations and documents required in assignments should be written in English, as well as pupil's reports.

Class attendance is strongly recommended.

8. Teaching resources

8.1. Teaching resources for the subject

Name	Type	Notes
Android Developers	Web resource	https://developer.android.com/
Android Studio	Others	Software
Android SDK	Others	Software

9. Other information

9.1. Other information about the subject

For attending this course, it is recommended that pupils bring a laptop with required software installed.