



POLITÉCNICA

INTERNATIONAL
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COORDINATION PROCESS OF
LEARNING ACTIVITIES
PR/CL/001



E.T.S. de Ingenieros
Informáticos

ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

103000868 - Mobile Applications Development

DEGREE PROGRAMME

10AZ - Master Universitario En Innovación Digital

ACADEMIC YEAR & SEMESTER

2021/22 - Semester 1

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1. Description

1.1. Subject details

Name of the subject	103000868 - Mobile Applications Development
No of credits	4.5 ECTS
Type	Optional
Academic year of the programme	Second year
Semester of tuition	Semester 3
Tuition period	September-January
Tuition languages	English
Degree programme	10AZ - Master Universitario en Innovación Digital
Centre	10 - Escuela Tecnica Superior De Ingenieros Informaticos
Academic year	2021-22

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

The subject - recommended (passed), are not defined.

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

CB06 - Poseer y comprender conocimientos que aporten una base u oportunidad de ser originales en el desarrollo y/o aplicación de ideas, a menudo en un contexto de investigación

CB10 - Que los estudiantes posean las habilidades de aprendizaje que les permitan continuar estudiando de un modo que habrá de ser en gran medida autodirigido o autónomo.

CE-CD09 - Capacidad para explorar formas de utilizar nuevas herramientas y técnicas de ciencia de datos con una mentalidad empresarial para enfrentar los desafíos empresariales y organizativos con una mentalidad empresarial

4.2. Learning outcomes

RA26 - Evaluate and implement systems that use accessibility APIs

RA21 - Implement basic interactive android applications

RA30 - Understand the particularities of user-centered design in mobile platforms and ubiquitous computing

* 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 using Java.

5.2. Syllabus

1. Introduction to Android platform
2. Android Activity lifecycle
3. Android Intents
4. Android UI layouts and components
 - 4.1. Layout basic design
 - 4.2. Developing UI in Android
5. Services
6. Introduction to data persistence features in Android
 - 6.1. Application preferences
 - 6.2. File system
 - 6.3. Content providers
7. Accessing web services using JSON
8. Broadcast receivers

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		Introduction to Android platform Duration: 02:00	
2	Android project tools and project structure Duration: 01:00	Android project tools and project structure Duration: 01:00	Android project tools and project structure Duration: 01:00 Android project tools and project structure Duration: 01:00	
3	Activity Duration: 01:00	Activity Duration: 01:00	Activity Duration: 01:00 Activity Duration: 01:00	
4	Intents Duration: 01:00	Intents Duration: 01:00	Intents Duration: 01:00 Intents Duration: 01:00	Project proposal Continuous assessment and final examination Presential Duration: 01:00
5	Data exchange in activities Duration: 01:00	Data exchange in activities Duration: 01:00	Data exchange in activities Duration: 01:00 Data exchange in activities Duration: 01:00	
6	Basic UI components Duration: 00:30	Basic UI components Duration: 01:30	Basic UI components Duration: 00:30 Basic UI components Duration: 01:30	
7	Services Duration: 00:30	Services Duration: 01:30	Services Duration: 00:30 Services Duration: 01:30	

8		Prototype design Duration: 02:00	Services Duration: 01:30	Prototype design Continuous assessment and final examination Presential Duration: 01:00
9	Broadcast receivers Duration: 00:30	Broadcast receivers Duration: 01:30	Broadcast receivers Duration: 00:30 Broadcast receivers Duration: 01:30	
10	Persistence Duration: 00:30	Persistence Duration: 01:30	Persistence Duration: 00:30 Persistence Duration: 01:30	
11		Persistence Duration: 02:00	Persistence Duration: 02:00	
12	Accessing web services Duration: 01:00	Accessing web services Duration: 01:00	Accessing web services Duration: 01:00 Accessing web services Duration: 01:00	
13		Prototype implementation Duration: 02:00	Prototype implementation Duration: 02:00	
14		Prototype implementation Duration: 02:00	Prototype implementation Duration: 02:00	
15				Application prototype Continuous assessment and final examination Presential Duration: 03:00 Pupil portfolio presentation Continuous assessment and final examination Presential Duration: 04:30
16				
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
4	Project proposal		Face-to-face	01:00	10%	5 / 10	CB06 CB10 CE-CD09
8	Prototype design		Face-to-face	01:00	10%	5 / 10	CB06 CB10 CE-CD09
15	Application prototype		Face-to-face	03:00	70%	5 / 10	CB06 CE-CD09 CB10
15	Pupil portfolio presentation		Face-to-face	04:30	10%	5 / 10	CE-CD09 CB06

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
4	Project proposal		Face-to-face	01:00	10%	5 / 10	CB06 CB10 CE-CD09
8	Prototype design		Face-to-face	01:00	10%	5 / 10	CB06 CB10 CE-CD09
15	Application prototype		Face-to-face	03:00	70%	5 / 10	CB06 CE-CD09 CB10
15	Pupil portfolio presentation		Face-to-face	04:30	10%	5 / 10	CE-CD09 CB06

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
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Application prototype		Face-to-face	12:00	90%	5 / 10	CE-CD09 CB10 CB06
Pupil portfolio presentation		Face-to-face	02:00	10%	5 / 10	CE-CD09 CB06

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 presentations.

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
The Busy Coder's Guide to Android Development by Mark Murphy	Bibliography	https://commonsware.com/Android/Android_3-3-CC.pdf
Web resources	Others	http://developer.android.com http://stackoverflow.com/questions/tagged/android https://groups.google.com/group/android-developers

9. Other information

9.1. Other information about the subject

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