ANX-PR/CL/001-01

LEARNING GUIDE

SUBJECT

105000396 - Programming for mobile devices

DEGREE PROGRAMME

10II - Grado En Ingenieria Informatica

ACADEMIC YEAR & SEMESTER

2018/19 - Semester 2

Index

Learning guide

1. Description

1.1. Subject details

Name of the subject	105000396 - Programming for mobile devices
No of credits	3 ECTS
Type	Optional
Academic year ot 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	2018-19

2. Faculty

2.1. Faculty members with subject teaching role

Name and surname	Office/Room	Email	Tutoring hours *
Raul Alonso Calvo (Subject coordinator)	2315	raul.alonso@upm.es	M - 10:00 - 13:00 W - 10:00 - 13:00
Guillermo Roman Diez	2304	guillermo.roman@upm.es	M - 10:00 - 14:00 Tu - 10:00 - 12:00
Cristian Moral Martos	5110	cristian.moral@upm.es	M - 12:00 - 15:00 W - 09:00 - 12:00

Sergio Paraiso Medina	2306	sergio.paraiso@upm.es	Sin horario.

* 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 II

- Concurrencia

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 limites 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. Mobile UI design
   2.1. Introduction to UI design
   2.2. Good practices and mobile UI prototyping
3. Introduction to principles in software design and development processes
   3.1. Principles of object oriented programming and design techniques for GUI
   3.2. Interaction programming and event driven programming
4. Introduction to Android architecture
   4.1. Android development tools
   4.2. Android UI layouts and components
   4.3. Intents and Activities
   4.4. Developing UI in Android
5. Introduction to data persistence features in Android
   5.1. Application preferences
   5.2. File system
   5.3. Content providers

6. Schedule

6.1. Subject schedule*

Week	Face-to-face classroom activities	Face-to-face laboratory activities	Other face-to-face activities	Assessment activities
1	**Introduction to Android platform** Duration: 02:00 Lecture			
2	**Introduction to UI design** Duration: 01:00 Lecture	**Introduction to UI design** Duration: 01:00 Laboratory assignments		
3	**Good practices and mobile UI prototyping** Duration: 01:00 Lecture	**Good practices and mobile UI prototyping** Duration: 01:00 Laboratory assignments		
4		**Good practices and mobile UI prototyping** Duration: 01:00 Laboratory assignments		**Mobile UI design** Group work Continuous assessment and final examination Duration: 01:00
5	**Principles of object oriented programming and design techniques for GUI** Duration: 01:00 Lecture **Interaction programming and event driven programming** Duration: 01:00 Lecture			
6	**Android development tools** Duration: 00:30 Lecture	**Android development tools** Duration: 01:30 Laboratory assignments		
7	**Android UI layouts and components** Duration: 00:30 Lecture	**Android UI layouts and components** Duration: 01:30 Laboratory assignments		
8	**Android UI layouts and components** Duration: 00:30 Lecture	**Android UI layouts and components** Duration: 01:30 Laboratory assignments		
9	**Intents and Activities** Duration: 00:30 Lecture	**Intents and Activities** Duration: 01:30 Laboratory assignments		**Application mockup** Group work Continuous assessment and final examination Duration: 08:00
10	**Intents and Activities** Duration: 00:30 Lecture	**Intents and Activities** Duration: 01:30 Laboratory assignments		

11	**Intents and Activities** Duration: 00:30 Lecture	**Intents and Activities** Duration: 01:30 Laboratory assignments		
12	**Developing UI in Android** Duration: 30:00 Lecture	**Developing UI in Android** Duration: 01:30 Laboratory assignments		
13	**Application preferences** Duration: 01:00 Lecture	**Application preferences** Duration: 01:00 Laboratory assignments		
14	**Android File System** Duration: 01:00 Lecture	**Android File System** Duration: 01:00 Laboratory assignments		
15	**Content Providers** Duration: 01:00 Lecture	**Content Providers** Duration: 01:00 Laboratory assignments		**Application prototype** Group work Continuous assessment and final examination Duration: 10:00
16				**Pupil portfolio presentation** Group presentation Continuous assessment and final examination Duration: 02:00

The independent study hours are training activities during which students should spend time on individual study or individual assignments.

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 subject schedule is based on a previous theorical planning of the subject plan and might go to through experience some unexpected changes along throughout the academic year.

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	Mobile UI design	Group work	Face-to-face	01:00	15%	5 / 10	CG-19 CG-24/25/26/27
9	Application mockup	Group work	No Presential	08:00	15%	5 / 10	CG-6 CG-24/25/26/27 Ce 44 CG-19 CG-2/CE45
15	Application prototype	Group work	No Presential	10:00	50%	5 / 10	CG-6 CG-24/25/26/27 Ce 44 CG-19 CG-2/CE45
16	Pupil portfolio presentation	Group presentation	Face-to-face	02:00	20%	5 / 10	CG-19 CG-24/25/26/27

7.1.2. Final examination

Week	Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
4	Mobile UI design	Group work	Face-to-face	01:00	15%	5 / 10	CG-19 CG-24/25/26/27
9	Application mockup	Group work	No Presential	08:00	15%	5 / 10	CG-6 CG-24/25/26/27 Ce 44 CG-19 CG-2/CE45
15	Application prototype	Group work	No Presential	10:00	50%	5 / 10	CG-6 CG-24/25/26/27 Ce 44 CG-19 CG-2/CE45
16	Pupil portfolio presentation	Group presentation	Face-to-face	02:00	20%	5 / 10	CG-19 CG-24/25/26/27

7.1.3. Referred (re-sit) examination

Description	Modality	Type	Duration	Weight	Minimum grade	Evaluated skills
Application prototype	Group work	Face-to-face	12:00	65%	5 / 10	CG-6 CG-24/25/26/27 Ce 44 CG-19 CG-2/CE45
Mobile UI design	Group work	Face-to-face	01:00	15%	5 / 10	CG-19 CG-24/25/26/27
Pupil portfolio presentation	Group presentation	Face-to-face	02:00	20%	5 / 10	CG-19 CG-24/25/26/27

7.2. Assessment criteria

This course is intended to be practical. iIt 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

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.