Teaching Guide					
Identifying Data					2020/21
Subject (*)	Architectures and Mobile Platforms			Code	614502005
Study programme	Mestrado Universitario en Enxeñaría Informática (plan 2012)				
Descriptors					
Cycle	Period	Year		Type	Credits
Official Master's Degree	2nd four-month period	First		Obligatory	6
Language	SpanishGalician				
Teaching method	Hybrid				
Prerequisites					
Department	Enxeñaría de Computadores				
Coordinador	Fernández Caramés, Tiago Manuel		E-mail	tiago.fernandez@udc.es	
Lecturers	Fernández Caramés, Tiago Manuel		E-mail	tiago.fernandez@udc.es	
Web	https://moodle.udc.es/course/view.php?id=54166				
General description	In this subject the student gains basic knowledge about mobile technologies and their application by means of design and development of applications for mobile devices.				

Contingency plan	1. Modifications to the contents - No changes will be performed. 2. Methodologies - *Teaching methodologies that are maintained - None. - *Teaching methodologies that are modified - Guest lectures: due to the exceptional situation, given the impossibility of being able to teach in a completely face-to-face way, virtual tools provided by the university will be used, which can be complemented with other tools. - ICT practicals: the labs that require specific equipment will be replaced with simulated or virtualized ones. Eventually, alternative practices will be proposed that do not require such equipment. These practicals may be oriented towards autonomous work to address conciliation and/or connectivity problems. - Mixed objective/subjective test: it will be replaced with a supervised project whose weight in the final mark will be 40%. 3. Mechanisms for personalized attention to students - Tutoring sessions (student attention) will be conducted electronically (e.g., through email, Teams, Moodle), which can be complemented with each other tools. In some of such tools, prior appointments will be agreed. 4. Modifications in the evaluation - The mixed test will be replaced with a supervised project, thus modifying the mark weights as follows: ICT practicals: 60%; Supervised project: 40%; 5. Modifications to the bibliography or webgraphy - There will be no modifications.

Study programme competences	
Code	Study programme competences
A11	Capacidade de deseñar e desenvolver sistemas, aplicacións e servizos informáticos en sistemas encaixados e ubicuos.
B1	Capacidade de resolución de problemas.
B5	Habilidades de xestión da información.
B9	Capacidade para xerar novas ideas (creatividade).
B10	Capacidade para proxectar, calcular e deseñar produtos, procesos e instalacións en todos os ámbitos da enxeñaría informática
B13	Capacidade para o modelado matemático, cálculo e simulación en centros tecnolóxicos e de enxeñaría de empresa, particularmente en tarefas de investigación, desenvolvemento e innovación en todos os ámbitos relacionados coa Enxeñaría en Informática
B14	Capacidade para a elaboración, planificación estratéxica, dirección, coordinación e xestión técnica e económica de proxectos en todos os ámbitos da Enxeñaría en Informática seguindo criterios de calidade e ambientais

B17	Capacidade para a aplicación dos coñecementos adquiridos e de resolver problemas en contornas novas ou pouco coñecidos dentro de contextos máis amplos e multidisciplinares, sendo capaces de integrar estes coñecementos
B21	Posuír e comprender coñecementos que acheguen unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, a miúdo nun contexto de investigación
B22	Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornas novas ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo
B23	Que os estudantes sexan capaces de integrar coñecementos e enfrontarse á complexidade de formular xuízos a partir dunha información que, sendo incompleta ou limitada, inclúa reflexións sobre as responsabilidades sociais e éticas vinculadas á aplicación dos seus coñecementos e xuízos
B25	Que os estudantes posúan as habilidades de aprendizaxe que lles permitan continuar estudando dun modo que haberá de ser en gran medida autodirixido ou autónomo
C4	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C7	Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.
C8	Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade

Learning outcomes			
Learning outcomes	Study programme competences		
Understand, design and develop systems and services for mobile devices.	AJ11	BJ1 BJ5 BJ9 BJ10 BJ13 BJ14 BJ17 BC1 BC2 BC3 BC5	CJ4 CJ6 CJ7 CJ8

Contents	
Topic	Sub-topic
Introduction to mobile architectures and platforms	Hardware: architectures and platforms. ARM architecture. Software: platforms and mobile operative systems. Historic perspective, development ecosystem, market and monetization.
User experience: Usability and user interfaces	Introduction to mobile app and user interface usability Style guides and design pattern for graphic user interfaces for mobile devices. Examples.

Mobile device architecture and software design. Application to Android	Building a first app: environment and development and debugging tools App components Relationship among apps, virtual machines and Linux processes Activity Life-cycle Task parallelization: AsyncTask Data serialization/deserialization, Fragments and Parcelables Services Content Providers, Content Resolvers, Loaders Recycler View Apps, processes and threads: IPC in Android Android Binder Geolocation Storage Multimedia Mobile device software patterns: MVC and its versions
Event-guided programming and concurrency management	Event-guided programming. Advanced concepts Patterns: Publisher/Subscriber, Active Object, Monitor Object, Half/Sync-Half-Async and Thread Pool. Application to Android
Web based, hybrid and native applications	Mobile web application development Hybrid mobile application development Development frameworks
Mobile platform sensing	Transducers Mobile displays. Types and technologies Mobile HMI
Pantallas e Mobile HMI	Pantallas nos dispositivos móbiles. Tipos e tecnoloxías empregadas. Mobile HMI.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A11 B5 B10 B13 B14 B17 B21 B25 C4 C6 C7 C8	21	33	54
ICT practicals	A11 B1 B5 B9 B10 B13 B14 B22 B23	26	52	78
Objective test	B1 B17 B22 B23	4	0	4
Personalized attention		14	0	14
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Guest lecture / keynote speech	Lectures on the content of the subject
ICT practicals	ICT practicals to put in practice the concepts learned on the lectures
Objective test	Test to assess the learned practical and theoretical concepts

Personalized attention	
Methodologies	Description
ICT practicals	The professor will tutor the students and will guide them during the practical lessons. Part-time students: it will not be required the attendance to the practical lessons, which will be flexible with the delivery and defence dates. In the same way, tutoring will be adapted to the scheduling restrictions of the part-time students.

Assessment			
Methodologies	Competencies	Description	**Qualification**
ICT practicals	A11 B1 B5 B9 B10 B13 B14 B22 B23	Valoración dos resultados e coñecementos obtidos nas prácticas desenvolvidas.	60
Objective test	B1 B17 B22 B23	Valoración das competencias asimiladas na materia.	40

Assessment comments

FIRST CALL

The practical part of the subject will consist in developing practical examples about the content of the theory lessons. Its evaluation will be perform progressively, with clear deadlines. Such a practical part could be replaced with the development of a mobile application or a individual assignment. The objective test will be divided into two parts: one oriented towards evaluating the practical developments and a second one about the theoretical content.

Part-time students: attendance to the practical part will not be required and its delivery will follow a flexible schedule.

SECOND CALL AND EXTRA CALLS

The students will have the opportunity to maintain the marks obtained during the ICT practicals and the supervised project. Such students will carry out a mixed test, establishing the final mark according to the same percentages applied for the first call. The rest of the students (including part-time students) will take a single mixed test (60% of the total mark) and will carry out a supervised project (40% of the total mark).

OTHER COMMENTS

No marks will be preserved from one course to another.

In case of detecting plagiarism, the student will be evaluated as failed (0) and the situation will be communicated to the master direction and to the corresponding authorities to take the appropriate measures.

Sources of information	
Basic	- Theresa Neil (2012). Mobile Design Pattern Gallery. O'Reilly - N. D. Lane (2010). A Survey of Mobile Phone Sensing. IEEE Communications Magazine - Keith Andrews (2012). Human-Computer Interaction. Graz University of Technology - Zheng-Hua Tan (2004). Instrumentation and data acquisition. Aalborg University, Denmark - Google (2013). Android developers website. http://developer.android.com http://developer.android.com/training/index.htmlhttp://developer.android.com/training/index.html
Complementary	- Pei Zheng (2005). Smart Phone and Next Generation Mobile Computing. Morgan Kaufmann - Sajal K. Das (2010). Mobile Handset Design . Wiley - Lauren Darcey (2011). Sams Teach Yourself Android Application Development in 24 Hours. Sams - Jakob Strom (2012). HMI Toolsuite for Android. Chalmers University of Technology, Gothenburg - Ricardo Galli Granada (2015). Principios y algoritmos de concurrencia. Autoeditado El libro "Principios y algoritmos de concurrencia" está disponible en Google Books.

Recommendations
Subjects that it is recommended to have taken before
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.