IDENTIFYING DATA

(*)Redes sen Fíos e Computación Ubicua

Subject	(*)Redes sen Fíos e Computación Ubicua			
Code	V05M145V01211			
Study programme	(*)Máster Universitario en Enxeñaría de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	5	Optional	1st	2nd
Teaching language	Spanish Galician English			
Department				
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General description	The subject "wireless networks and ubiquitous computing" mainly focus on the study of wireless technologies that support the inherent connectivity and communications in such environments where mobile users interact among them and with other devides distributed all along the path they are passing through, to implement and/or enjoy numerous and new services and applications. With lesser depth, other questions related to hardware/software aspects of the smart objects that will be involved in this kind of wireless/mobile communications/applications, will also be studied.			

Competencies

Code	
A1	CB1 The knowledge and understanding needed to provide a basis or opportunity for being original in developing and/or applying ideas, often within a research context.
A5	CB5 Students must have learning skills to allow themselves to continue studying in largely self-directed or autonomous way
B3	CG3 The ability to lead, plan and monitor multidisciplinary teams.
B8	CG8 The ability to apply acquired knowledge and to solve problems in new or unfamiliar environments within broader and multidiscipline contexts, being able to integrate knowledge.
B12	CG12 To have skills for lifelong, self-directed and autonomous learning.
C4	CE4 The ability to design and plan networks for transporting, broadcasting and distribution of multimedia signals.
C6	CE6 The ability to model, design, implement, manage, operate, and maintain networks, services and contents.
C7	CE7 The capacity for planning, decision making and packaging of networks, services and applications, taking into account the quality of service, direct and operating costs, plan implementation, monitoring, safety procedures, scaling and maintenance, as well as managing and ensuring quality in the development process.
C9	CE9 The ability to solve convergence, interoperability and design of heterogeneous networks with local, access and trunk networks; as well as the integration of telephonic, data, television and interactive services.
C24	CE24/TE1 Ability to understand the fundamentals of distributed systems and distributed computing paradigms, and its application in the design, development and management in grid, ubiquitous computing scenarios and cloud systems.

Learning outcomes

Expected results from this subject	Training and Learning Results

(*) To understand the fundamentals of wireless communications. To understand the basic concepts behind mobile communications. To know the main protocols and architectures used in wireless and mobile networks. Knowledge of the basis and main concepts of ubiquitous/pervasive computing. To understand the relationship/dependence between ubiquitous computing and context information (context-aware computing). To know different pervasive computing systems . Knowledge of recent advances and trends related to ubiquitous computing.

A1
A5
B3
B8
B12
C4
C6
C7
C9
C24

Contents

Topic	
Fundamentals of wireless networks.	Channel characteristics; medium access control; mobility management; routing and discovery; securiry issues; power safe.
Architectures and standards.	Wireless access/local/personal area networks; wireless sensor networks; TCP/IP issues related with the connectivity/communication of wireless/mobile devices.
Basis of ubiquitous computing.	Context-aware computing; service architecture; data dissemination and management; sinchronization and consistency; service discovery.

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	18	36	54
Laboratory practises	10	52	62
Forum Index	0	4	4
Long answer tests and development	2	0	2
Reports / memories of practice	0	3	3

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Master Session	Explanation, by teachers, of the main theoretical contents related to wireless networks and ubiquitous computing. (Competences CE4, CE6, CE7, CE9)
Laboratory practises	Several activities will be developed: 1) Implementation by learners of guided and supervised exercises in the lab. 2) A laboratory project of a certain magnitude will be defined - related to the design, implementation or testing of a some protocol, system, application, or service - to be developed in a group throughout the semester. This work will be supervised by teachers with regular meetings each 10/15 days. (Competences CB5, CG8, CG3, CG12) 3) And, finally, students will have to read, present and defense -in front of the class mates- the main ideas that lie behind certain technical/scientific articles related to the course contents. (Competences CB5, CG12).
Forum Index	An educational social network will be used to stimulate discussion and other online activities that involve collaborative and/or competitive participation of students.

Personalized attention

Methodologies	Description
Master Session	
During tutorial sessions, teachers will offer personal attention either individually -to strengthen or guide the student in understanding the theoretical concepts explained in masterclasses or lab sessions- or in groups -to supervise the work associated with the big project that the students must carry out as a team.
In the tutorial group sessions -that are mandatory (about one hour each 15 days)- the solutions proposed by the members of the group will be discussed and reviewed, and the professors will check and promote a fairly participation of each member of the different teams.
Laboratory practises	
During tutorial sessions, teachers will offer personal attention either individually -to strengthen or guide the student in understanding the theoretical concepts explained in masterclasses or lab sessions- or in groups -to supervise the work associated with the big project that the students must carry out as a team.
In the tutorial group sessions -that are mandatory (about one hour each 15 days)- the solutions proposed by the members of the group will be discussed and reviewed, and the professors will check and promote a fairly participation of each member of the different teams.

Assessment

Description		Qualification	Training and Learning Results		
Master Session	A theoretical (written) examination (T) will be held at the end of the course.	35	A1		C4 C6 C7 C9 C24
Laboratory practises	Attendance of these sessions are mandatory. If for some reason one is lost, the students will have to retake it doing some supplementary homework defined ad hoc by the teachers. Any concept studied in these practises may also be required in the final theoretical examination (T). The 50% of the assesment of the subject will be tied to the project work (P) in which the student will be involved. This partial grade will be evaluated after delivery, assessing issues such as the correctness, the quality, the originality, and the functionalities of the implementation, as well as the associated presentation and/or final report. Also during the development of the project, the teachers will supervise how things are being done by the group to assess the individual involvement of each student in the development. And the remaining 15% will come from debate sessions, promoted by teachers ahead of time, and where we are going to evaluate the understanding of the addressed topic and the quality and clarity of the presentation that the speaker will stand up to other peers, or the participation of the listeners in the discussions.	65	A1 A5	B3 B8 B12	C7
Forum Index	The assessment of the students' participation in this online activity is integrated together with the activity labeled as "debate" within the laboratory practises assesment.	0			

Other comments on the Evaluation

The assessment of the subject can follow either the "continuous evaluation" philosophy or a lonely and "final examination". The student will choose the "continuous evaluation" option if he/she attends any of the control sessions -with the exception of the first one where the teamworks will be assigned- associated to the project work (P) - within laboratory practises.

The students that do not follow the continuous assessment, must take a special final examination that will be composed of three parts: a theory examination, like the final one in the continuous evaluation (T), an aptitude test in the laboratory (to verify the authenticity of the authorship of the project), and a practical project that must be developed individually (P, substitute of the supervised teamwork within continuous assessment). The whole mark, in this case, will be the mean between the theoretical exam and the project work, provided that the student pass the aptitude test in the lab.

Finally, the extraordinary examination session in july will have the same characteristics than the special final examination just described, but the students will be able to inherit the partial mark of any activity (T or/and P) if that has been passed during the same academic year, independently of the assesment modality that the student had chosen.

The use of any supporting documentation during theoretical exams must be explicitly authorized by the professors.

Sources of information
Viajy Garg, **Wireless Communications and Networking**, 1,

Kaveh Pahlavan, Prashant Krishnamurthy, **Networking Fundamentals: Wide, Local and Personal Area Communications**, 1,

Pei Zheng, Larry L. Peterson, Bruce S. Davie, Adrian Farre, **Wireless Networking Complete**, 1,

F. Adelstein, Sandeep K.S. Gupta, Golden G. Richard III, Loren Schwiebert, **Fundamentals of Mobile and Pervasive Computing**, 1,

Jean-Philippe vasseur, Adam Dunkels, **Interconnecting smart objects with IP**, 1,

James F. Kurose, Keith W. Ross, **Computer Networking: A Top-Down Approach**, 6,

Recommendations