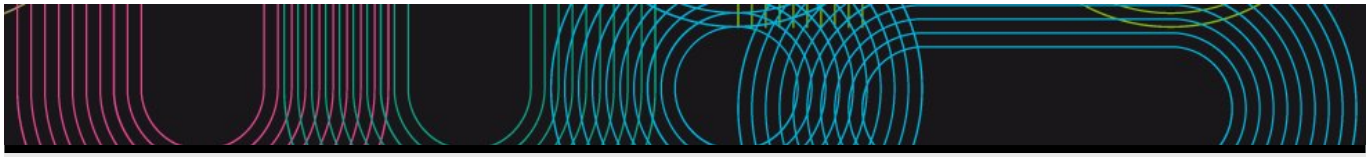

IDENTIFYING DATA				
Wireless and mobile networks				
Subject	Wireless and mobile networks			
Code	V05G300V01942			
Study programme	(*)Grao en Enxeñaría de Tecnoloxías de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician English			
Department				
Coordinator	Gil Castiñeira, Felipe José			
Lecturers	Gil Castiñeira, Felipe José López Bravo, Cristina			
E-mail	xil@gti.uvigo.es			
Web	http://faitic.uvigo.es			
General description	The subject "Wireless and Mobile Networks" (redes sen fíos e móbiles) examines the area of wireless and mobile networks, one of the technological basis of the present society, studying the existing challenges for the communications protocols, and looks at the opportunities that provides continuous connectivity even in movement. The focus of this subject will be on network protocols above physical layer (nevertheless, it will touch the most important physical layer properties). The documentation will be available in english.			

Competencies	
Code	
B3	CG3: The knowledge of basic subjects and technologies that capacitates the student to learn new methods and technologies, as well as to give him great versatility to confront and update to new situations
B4	CG4: The ability to solve problems with initiative, to make creative decisions and to communicate and transmit knowledge and skills, understanding the ethical and professional responsibility of the Technical Telecommunication Engineer activity.
B9	CG9: The ability to work in multidisciplinary groups in a Multilanguage environment and to communicate, in writing and orally, knowledge, procedures, results and ideas related with Telecommunications and Electronics.
C85	(CE85/OP28) The ability to analyze, plan and deploy wireless communication networks for different coverage ranges: metropolitan, local and short range.
D2	CT2 Understanding Engineering within a framework of sustainable development.
D3	CT3 Awareness of the need for long-life training and continuous quality improvement, showing a flexible, open and ethical attitude toward different opinions and situations, particularly on non-discrimination based on sex, race or religion, as well as respect for fundamental rights, accessibility, etc.
D4	CT4 Encourage cooperative work, and skills like communication, organization, planning and acceptance of responsibility in a multilingual and multidisciplinary work environment, which promotes education for equality, peace and respect for fundamental rights.

Learning outcomes			
Expected results from this subject	Training and Learning Results		
Understand the main concepts of wireless communications.	B3	C85	D2 D3
Understand the main concepts of mobile communications.	B3	C85	D2 D3

Know the main protocols used in wireless communication networks.	B3	C85	D2 D3
Know the architectures used in wireless communication networks.	B3	C85	D2 D3
Ability to design mobile wireless networks.	B4 B9	C85	D2 D3 D4

Contents	
Topic	
Introduction to wireless communications	Channel characteristics Multiple access Modulation
Principles of operation of wireless networks	Mobility management Introduction to ubiquitous computing Ad hoc networks, routing Security Network topologies
Wide area networks	Architecture Mobile networks Network topologies Practical case
Local networks	Architecture: ad hoc and infrastructure based networks User authentication approaches Security Quality of services Practical case
Low range networks	Architecture Bandwidth/power consumption balance Personal communication Industrial communication

Planning			
	Class hours	Hours outside the classroom	Total hours
Practice in computer rooms	13	39	52
Integrated methodologies	6	28	34
Master Session	19	38	57
Reports / memories of practice	0	3	3
Systematic observation	1	0	1
Jobs and projects	1	0	1
Short answer tests	2	0	2
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Practice in computer rooms	Students will complete guided and supervised practices in the laboratory.
Integrated methodologies	Team development of the design, implementation and validation of a protocol, system, application or service.
Master Session	Professors present the main theoretical contents related to wireless and mobile networks.

Personalized attention	
Methodologies	**Description**
Practice in computer rooms	The professors of the course will provide individual attention to the students during the course, solving their doubts and questions. In addition, the professors will advise and will guide the students during the realization of the tasks.
Integrated methodologies	The professors of the course will provide individual attention to the students during the course, solving their doubts and questions. In addition, the professors will advise and will guide the students during the realization of the tasks.

Assessment

	Description	Qualification	Training and Learning Results		
Practice in computer rooms	Students will fill lab reports to asses the correct realization and understanding of the laboratory tasks.	20	B3 B4	C85	
Integrated methodologies	Students will be divided in groups to complete the design, implementation and validation of a protocol, a system, an application or service. The result will be evaluated after the delivery, having into account key aspects such as the correction, the quality, the performance and the functionalities. In addition, during the implementation of the project, the design and the evolution of the development will be evaluated.	50	B3 B4 B9	C85	D2 D3 D4
Master Session	Students will be evaluated to asses what they have learned in master sessions.	30	B3	C85	

Other comments on the Evaluation

In order to pass the course it is necessary to complete the different parts of the course (master sessions, practices in labs, and tutored works). The final grade will be the **weighted geometric mean** of the grades of the different parts (i.e. it is not possible to pass the subject with a zero in one part). If "x" is the grade obtained for the master sessions, "y" for the practices in labs, and "z" for the tutored works, the final grade will be: grade = x^0.3*y^0.2*z^0.5

During the first month, students must declare if they opt for continuous or final assessment. Students who select continuous assessment and submit the first task or lab report may not be listed as "Not Present".

Students that opt by the final assessment procedure, must submit an additional dossier with detailed information about the events and issues that arose during the execution of the different tasks, and especially the tutored work. In addition, during the first month of the course, professors will notify students if they have to do the tutored work individually, in the case they opt for final assessment.

Second opportunity to pass the course

The course final exam will only be held for students who failed the course in the first oportunity (semester final exam).

In order to pass the course it is necessary to complete the different parts of the subject, which will be evaluated as is indicated in the tests description section. Besides, it will be necessary to submit an additional dossier with detailed information about the events and issues that arose during the execution of the different tasks, and especially the tutored work.

Students that have opted by the continuous assessment procedure, can decide to maintain the grades of the parts they have already passed in the first opportunity or discard them.

Other comments

The grades obtained are only valid for the current academic year.

Although the tutored work will be completed (if possible) in groups, the performance of each student in his or her group will be analyzed continuously

Although the tutored work will be completed (if possible) in groups, the performance of each student in his or her group will be monitored continuously. In the case in which the performance of a member of the group wouldn't be adequate compared with the performance of his or her team mates, he or she could be excluded from the group and/or qualified individually.

The use of any material during the tests will have to be explicitly authorized.

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,

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

Recommendations

Subjects that it is recommended to have taken before

Computer Networks/V05G300V01403
Data Networks: Technology and Architecture/V05G300V01542