Universitat de les Illes Balears

Teaching guide

Academic year	2016-17
Subject	22375 - Laboratory of Networks and Telecommunication Projects
Group	Group 4, 2S, GMIT, GTTT
Teaching guide	A
Language	English

Subject identification

Subject	22375 - Laboratory of Networks and Telecommunication Projects
Credits	2.4 de presencials (60 hours) 3.6 de no presencials (90 hours) 6 de totals (150 hours).
Group	Group 4, 2S, GMIT, GTTT (Campus Extens)
Teaching period	Second semester
Teaching language	Catalan

Professors

Lecturers	**Horari d'atenció als alumnes**					
	Starting time	**Finishing time**	**Day**	**Start date**	**Finish date**	**Office**
Miquel Àngel Bordoy Marcó miquel.bordoy@uib.es	You need to book a date with the professor in order to attend a tutorial.					
Jaume Ramis Bibiloni	15:30	16:30	Tuesday	01/09/2016	31/07/2017	135
jaume.ramis@uib.es	11:30	12:30	Tuesday	01/09/2016	31/07/2017	135

Contextualisation

The module “Laboratori de xarxes i projectes de telecomunicació” is addressed to students on the 4th year of the degree 'Grau en Enginyeria Telemàtica' and to students on the 5th year of the double-degree 'Grau en Enginyeria Telemàtica i en Matemàtiques'. Its main objective is to deepen, from a global perspective, into the skills defined in the telecomunications block of the common module as well as into the skills defined in the telematic networks block of the telematic specific module. Along with the subjects “Laboratori d’Electrònica”, “Laboratori d’Informàtica” and “Laboratori de Xarxes, Aplicacions i Serveis Telemàtics” and the “Treball de Final de Grau”, it conforms de practical module of the degree.

Requirements

Recommendable

To take full advantage of this course, it is essential that students have the knowledge corresponding to the blocks of Telecommunications and Telematic Networks, detailed below:

Telecomunications block:

- Fonaments de xarxes de telecomunicació
- Arquitectura i interconnexió de xarxes
- Gestió de xarxes
- Instal•lacions de telecomunicació
- Projectes

Telematic networks block:

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- Xarxes d'operadora
- Xarxes d'àrea local i intranets
- Xarxes multimèdia
- Planificació de xarxes

Skills

The specific skills listed in the Ministerial Order corresponding to this degree are very extensive. This subject focuses, from a global perspective, on the skills corresponding to 'networks and telecommunications projects' in the block of telecommunications of the common module and the block of telematic networks in the telemathic specific module.
The program of this subject will rely on cooperative learning based on projects.

Specific

* CC4: Ability to analyze and define the fundamental parameters of a communications system.
* CC5: Ability to assess the advantages and disadvantages of different technological alternatives of implementation of communication systems, from the point of view of the signal space, disturbance and noise, and analog and digital modulation systems.
* CC12: Knowledge and use of concepts of network architecture, protocols and communication interfaces.
* CC13: Ability to differentiate the concepts of access networks and transport networks, circuit-switched and packet-switched networks, wired and mobile/wireless networks, as well as distributed systems and network applications, voice services, data services, audio services, video services and interactive and multimedia services.
* CC14: Knowledge of methods of network interconnection and routing, as well as the basics of network planning and network dimensioning based on traffic parameters.
* CC15: Knowledge of legislation and regulation of telecommunications at national, European and international levels.

Generic

* CG5: Writting skills for projects and technical documentation.
* CG6: Oral: fluency and clarity in the presentation of results, products and services in both specialized and non-specialized audiences.
* CG7: Knowledge of software and tools to help in the generation and presentation of documents.
* CG8: Knowledge of English: ability to understand, speak and write in English, at an intermediate level.
* CG9: Ability to work in multidisciplinary and multilingual teams.
* CG10: Leadership.
* CG11: Ability to manage resources and projects.

Basic

* You may consult the basic competencies students will have to achieve by the end of the degree at the following address: http://www.uib.eu/study/grau/Basic-Competences-In-Bachelors-Degree-Studies/

Content

Theme content

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A. Review of theoretical contents

A1. Ethernet IEEE802.3 (2h)

A2. Network elements (2h)

A3. Local Area Networks (2h)

A4. Internet Protocol (4h)

B. Development of a whole project of telematics engineering

B1. Technical Project (8h)

Design of a company network with different headquarter/offices. The company is divided into different functional departments. The network design must include the LAN and WLAN for each office and the WAN interconnection.

B2. Project Management Plan (4h)

The Project Management Plan must include the following areas: integration, scope, time, stakeholders, costs and procurement.

C. Networking laboratory

C1. VLANs, STP (8h)

Virtual Local Area Networks configuration

Spanning Tree Protocol analysis

C2. Routing, DHCP, NAT (8h)

Routing tables and routing protocols configuration

Dynimic Host Configuration Protocol study

Network Address Translation configuration

C3. Security (6h)

Network security and access premissions

Firewalls configuration

C4. WLANs (6h)

Wireless Local Area Networks design and configuration

Teaching methodology

In-class work activities

Modality	Name	Typ. Grp.	Description	Hours
Practical classes	Practical classes	Large group (G)	Students will work cooperatively (working-teams), developing projects in which they will have to apply the skills corresponding to the telecommunications block and to the telematic networks block. They must develop a telematics engineering project (technical project report and project management plan), as well as its presentation in class.	24

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Modality	Name	Typ. Grp.	Description	Hours
			Skills CC4, CC5, CC12, CC13, CC14, CC15, CG7, CG8, CG9, CG10 and CG11.	
Assessment	Exam	Large group (G)	Students must take an exam in the examination period. CC12 and CC14 skills will be assessed.	2
Assessment	Group-mentoring	Large group (G)	The lecturer will continuously monitor and guide students in the development of their project. Given the cooperative-project approach of this subject, mentoring will be developed in working-teams, according to the schedule set by the lecturer. Skills CC4, CC5, CC12, CC13, CC14, CC15, CG8, CG9 and CG10 will be assessed.	4
Assessment	Laboratory	Medium group (M)	Students will work cooperatively (working-teams) with real network elements in order to improve their knowledge about configuration of real communications/networking devices. Skills CC4, CC5, CC12, CC13, CC14, CC15 and CG5 will be assessed.	28
Assessment	Reports-presentations	Large group (G)	Students will develop a telematics engineering project (technical project report and project management plan) and they will have to present it in class. This way, the skills corresponding to the telecommunications block and to the telematic networks block, as well as their communication skills and their ability to solve problems and to develop projects, will be assessed. There exist the possibility of co-assessment among students to asses this activity. Skills CC4, CC5, CC12, CC13, CC14, CC15, CG5, CG6, CG7 and CG8 will be assessed.	2

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Campus Extens platform.

Distance education work activities

Modality	Name	Description	Hours
Individual self-study	Classroom activities study	Students will consolidate the contents introduced in class (labs, mentoring and presentations). They will also have to review contents from previously studied subjects corresponding to the telecommunications block and to the telematic networks block. Skills CC4, CC5, CC12, CC13, CC14, CC15, CG5, CG6, CG7, CG8, CG9, CG10 and CG11.	40
Group self-study	Projects	Students must develop a telematics engineering project (technical project report and project management plan), as well as its presentation in class. They will work in groups to perform this activity.	50

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Modality	Name	Description	Hours
		Skills CC4, CC5, CC12, CC13, CC14, CC15, CG5, CG6, CG7, CG8, CG9, CG10 and CG11.	

Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

Student learning assessment

Assessment in advance of this subject is not allowed.

There are two itineraries:

- Itinerary A is the standard itinerary. To join this itinerary, a minimum attendance of 80% is required and work must be developed in teams.
- Itinerary B is only available for part-time students.

Assessment will consist of group-mentoring, reports-presentations, laboratory assessment and an exam in the examination period.

Regarding group-mentoring (it applies to students from both itineraries):

* Students will deliver their assignments (corresponding to the technical project as well as the project management plan) throughout the term, according to the schedule set by the lecturer, and a group-mentoring with the team members and the lecturer will be performed for each assignment/deliverable.
* For itinerary-B students, in case they can not join this schedule (justified reasons), they can arrange alternative appointments with the lecturer.
* The lecutrer will continuously assess the work of the itinerary-A students throughout the term.
* This activity is non-retrievable.

Regarding reports-presentations (it applies to students from both itineraries):

* Students will have to deliver a final version of their whole technical project and project management plan, at the end of the term, according to the schedule set by the lecturer. They will also have to present them in class.
* The lecutrer will continuously assess the work of the itinerary-A students throughout the term.
* This activity is non-retrievable.

Regarding laboratory assessment (it applies to itinerary A students):

* The lecturer will assess students throughout the term.
* The lecutrer will continuously assess the work of the itinerary-A students throughout the term.
* This activity is non-retrievable.

Regarding the examination (it applies to students from both itineraries):

* It is required to obtain a mark greater or equal than 5.
* In case of failure, the students will have the opportunity to take a second exam in the extraordinary examination period.

Below are details for each assessment procedure, criteria and their weight in the rating of the course for both itineraries.

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Exam

Modality	Assessment
Technique	Objective tests **(retrievable)**
Description	Students must take an exam in the examination period. CC12 and CC14 skills will be assessed.
Assessment criteria	Quality and soundness of reasoning in: - proposed solutions to problems - answers to questions Precision and accuracy of the results. Clarity, intelligibility and spelling and grammatical correctness in the answers.

Final grade percentage: 35% for the training plan A
Final grade percentage: 50% for the training plan B

Group-mentoring

Modality	Assessment
Technique	Oral tests **(non-retrievable)**
Description	The lecturer will continuously monitor and guide students in the development of their project. Given the cooperative-project approach of this subject, mentoring will be developed in working-teams, according to the schedule set by the lecturer. Skills CC4, CC5, CC12, CC13, CC14, CC15, CG8, CG9 and CG10 will be assessed.
Assessment criteria	Degree of participation of students in the group-mentoring, quality and soundness of their reasonings and precision and accuracy in their answers.

Final grade percentage: 30% for the training plan A
Final grade percentage: 30% for the training plan B

Laboratory

Modality	Assessment
Technique	Other methods **(non-retrievable)**
Description	Students will work cooperatively (working-teams) with real network elements in order to improve their knowledge about configuration of real communications/networking devices. Skills CC4, CC5, CC12, CC13, CC14, CC15 and CG5 will be assessed.
Assessment criteria	Degree of participation in the laboratory. Quality and soundness of the reasonings. Precision and accuracy in the answers.

Final grade percentage: 15% for the training plan A
Final grade percentage: 0% for the training plan B

Reports-presentations

Modality	Assessment
Technique	Oral tests **(non-retrievable)**
Description	Students will develop a telematics engineering project (technical project report and project management plan) and they will have to present it in class. This way, the skills corresponding to the telecommunications block and to the telematic networks block, as well as their communication skills and their ability to solve problems

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	and to develop projects, will be assessed. There exist the possibility of co-assessment among students to asses this activity. Skills CC4, CC5, CC12, CC13, CC14, CC15, CG5, CG6, CG7 and CG8 will be assessed.
Assessment criteria	The report and the presentation of the technical project and the project management plan will be assessed taking into account: - Quality and soundness of the development of the project. - Precision, conciseness, clarity, consistency and spelling and grammatical correctness of the document. - Conciseness and precision, organization and structure, suitability to the audience and degree of preparation of the presentation in class.

Final grade percentage: 20% for the training plan A
Final grade percentage: 20% for the training plan B

Resources, bibliography and additional documentation

Basic bibliography

* Guía de los Fundamentos para la Dirección de Proyectos (Guía del PMBOK).
* Transparències i apunts de l'assignatura Xarxes d'Àrea Local i Intranets.
* Transparències i apunts de l'assignatura Xarxes d'Operadora.
* Transparències i apunts de l'assignatura Arquitectura i Interconnexió de Xarxes.
* Transparències i apunts de l'assignatura Projectes.
* El Treball de Final de Grau a l'EPS (http://eps.uib.es/gestui-administrativa/) i les referències allà indicades.
* El treball en equip (http://www.ice.udl.cat/upu/treball_equip.pps).

Complementary bibliography

* El proyecto telemático, Sistemas de Cableado Estructurado (SCR) y Proyectos de Infraestructuras Comunes de Telecomunicaciones (ICT), Vamuel Álvarez González y otros autores, COIT, 2006
* Emerging Technologies in Wireless LANs: Theory, Design, and Deployment, Benny Bing, Cambridge University Press, 2007

Other resources

* All the information, slides and working material will be available at the web page in Campus Extens.
* Web page of Colegio Oficial de Ingenieros de Telecomunicación (http://www.coit.es/).
* Web page of Colegio Oficial de Ingenieros Técnicos de Telecomunicación (http://www.coitt.es/).

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