Universida_{de}Vigo

IDENTIFYING DATA
(*)Sistemas electrónicos de comunicacións

Subject	(*)Sistemas electrónicos de comunicacións
Code	V12G330V01922
Study programme	(*)Grao en Enxeñaría Electrónica Industrial e Automática

Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st

Teaching language	Spanish
Department	
Coordinator	Soto Campos, Enrique
Lecturers	Soto Campos, Enrique
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General description	The aim of this subject is to teach the basis of the theory of communications, in particular of the digital communications and of the electronic systems used in them.

Competencies

Code	
A34	(*)TIE3 Coñecemento dos fundamentos e aplicacións da electrónica dixital e microprocesadores.
B2	(*)CT2 Resolución de problemas.
B3	(*)CT3 Comunicación oral e escrita de coñecementos na lingua propia.
B9	(*)CS1 Aplicar coñecementos.
B17	(*)CP3 Traballo en equipo.

Learning aims

Expected results from this subject	Training and Learning Results
Related to *TIE3: Knowledge of the foundations and applications of the digital electronics and microprocessors.	A34
*CT2: Resolution of problems.	B2
*CT3: oral and written communication of knowledge in native tongue	B3
*CS1: knowledge application.	B9
*CP3: team work.	B17

Contents

Topic	
Introduction to communications systems	Elements of a communication system. Electromagnetic spectrum. Time and frequency domain. Noise and communications.
Introduction to digital communications systems	Systems classification. Sampling. Quantification. PCM.
The ISO OSI standard	Definitions. Justification. OSI Levels.
Physical layer: transmission media	Wires and categories. Microwaves links. Satellite channels. Optical fibre.
Physical layer: base band modulation	Definitions. Digital standards. Base band modulations. Classification. Clock recovery. Spectrum. AC coupling. Error protection. Trasparency.
Physical layer: pass band modulation	Analog standards. Electrical attributes. Pass band modulations: in amplitude, phase and frequency.
Physical layer: parallel standards	Parallel port. GPIB BUS.
Data link layer: Functions	Definitions. Frame synchronisation and trasparency.

Data link layer: transmission error control	Error control codes. Block codes. Linear group codes. Cyclic codes. Convolutional codes: Viterbi algorithm .
Data link layer: Coordination of the communication	Centralised. Contention.
Data link layer: sharing of the physical circuit	Static allocation: Multiplexing. Dynamic allocation: Distributed. Random access. Regulated access. Spread spectrum systems.
Data link layer: failure recovery and flow control	Mechanisms of failure recovery. Protocols of flow control.
Data link layer: Protocols	Character oriented protocols: ASCII. Bit oriented protocols: HDLC.
Hierarchy of communications in the industry	CIM. Examples. Field buses.
Computer Networks	Local area networks. Internet. Convergence of networks of data and voice. ATM. DSL.
Analog communications	AM. FM. Television.

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	21	31.5	52.5
Classroom work	4.5	18	22.5
Troubleshooting and / or exercises	5	7.5	12.5
Previous studies / activities	0	22.5	22.5
Autonomous troubleshooting and / or exercises	0	20	20
Laboratory practises	18	0	18
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
Master Session	Most important aspects of the subjetc will be explained, looking for the active participation of the student posing questions that has to resolve in class.
Classroom work	These assigments look for the student to apply the exposed basic theory in class to real systems and in this way understand this theory and how is put in practice. They will make it in groups to boost team work. They will be presented in class.
Troubleshooting and / or exercises	The students will resolve in class with the help of the professor exercises of application of the theory.
Previous studies / activities	Preparatory work masterclass: the student has to read the subject previously to pose the doubts that arise him. Preparatory work resolution problems: the student has to at least have tried to resolve the problems proposed to understand better their resolution. Preparatory work laboratory: the student has to read and prepare the practice previously for his correct undestanding.
Autonomous troubleshooting and / or exercises	With the aim of checking the success of the learning process, the student will have at his disposal bulletins of problems to resolve on their own.
Laboratory practises	Practices of laboratory on systems Promax EC-796, trainers of digital communications, where will see in practice the systems of digital communications.

Personalized attention

Methodologies	Description
Laboratory practises	The students will be able to access anytime to academic support through the office time of the professor and email.
Master Session	The students will be able to access anytime to academic support through the office time of the professor and email.
Classroom work	The students will be able to access anytime to academic support through the office time of the professor and email.
Troubleshooting and / or exercises	The students will be able to access anytime to academic support through the office time of the professor and email.

Tests	Description
Short answer tests	The students will be able to access anytime to academic support through the office time of the professor and email.

Assessment

Description	Qualification

Master Session	The participation in class with comments and questions will be valued.	5
Classroom work	Presentation of the assignment: description of an applied communication system.	30
Troubleshooting and / or exercises	The participation in class with the resolution of problems will be valued.	5
Laboratory practises	The realisation of all the tasks of each practice will mark in function of his fulfillment.	20
Short answer tests	This test is conceived to check the basic knowledge of the subject.	40

Other comments on the Evaluation

You must obtain a minimum of 5 over 10 in each of the parts: laboratory practices, classroom work and short answer test, to obtain a pass qualification in the subject.

Optionally assigments can be done in English.

Students who waive the continuous assessment must pass a written test more extensive than that of minimum knowledge applied to the rest.

Sources of information

Roy Blake, **Electronic Communications Systems**, Delmar Thomson Learning,

Carl Nassar, **Telecommunications Demystified: A Streamlined Course in Digital Communications (and Some Analog) for EE Students and Practicing Engineers**, LLH Technology Publishing,

Ian Glover, Peter M. Grant, **Digital Communications (3rd Edition)**, Prentice Hall,

Recommendations
Subjects that continue the syllabus

(*)Electrónica dixital e microcontroladores/V12G330V01601

Subjects that it is recommended to have taken before

(*)Fundamentos de electrónica/V12G330V01402

(*)Fundamentos de teoría de circuítos e máquinas eléctricas/V12G330V01303

(*)Electrónica dixital e microcontroladores/V12G330V01601