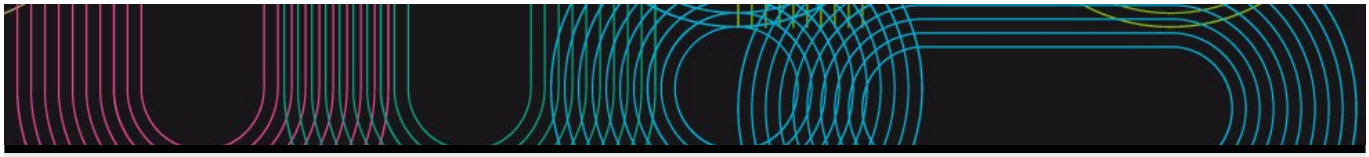

IDENTIFYING DATA				
Spectrum Management				
Subject	Spectrum Management			
Code	V05G300V01612			
Study programme	(*)Grao en Enxeñaría de Tecnoloxías de Telecomunicación			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language	Spanish			
Department				
Coordinator	García Sánchez, Manuel			
Lecturers	García Sánchez, Manuel			
E-mail	manuel.garciasanchez@uvigo.es			
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General description	The management of the radioelectric spectrum, understood this like a natural resource, limited and scarce, pursues the most efficient use of the spectrum by means of the application of effective processes, to facilitate the implementation of communication systems and to guarantee minimum interference. To acomplish this objectives, engineering tools, planning, management and technical survey and certification are needed. Besides in this matter study of the SMATV systems and Structured Wiring are included.			

Competencies	
Code	
A5	CG5: The knowledge to perform measurements, calculations, assessments, appraisals, technical evaluations, studies, reports, task scheduling and similar work to each specific telecommunication area.
A6	CG6: The aptitude to manage mandatory specifications, procedures and laws.
A7	CG7: The ability to analyze and assess the social and environmental impact of technical solutions.
A8	CG8: To know and apply basic elements of economics and human resources management, project organization and planning, as well as the legislation, regulation and standarization in Telecommunications.
A9	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.
A30	CE21/ST1 The ability to construct, exploit and manage telecommunication networks, services, process and applications, considered as systems of receiving, transporting, representation, processing, storage, management and presentation of multimedia information from the point of view of transmission systems.
A34	CE25/ST5 The ability to select transmission antennas, equipment and systems, propagation of guided and non-guided waves, with electromagnetic, radiofrequency and optical media, and their corresponding radio electric spectrum management and frequency designation.

Learning aims	
Expected results from this subject	Training and Learning Results
Know and comprise the mechanisms of exploitation and management of the radioelectric spectrum. Capacity for the management of the radioelectric specrum and allocation of frequencies. Capacity for the design of radioelectrric stations.	A30 A34
Knowledges for the realisation of measures of surveillance of the radioelectric spectrum. Capacity for the certification of radioelecrric stations according to the national rules. Capacity for checkingof the exposition limits to the electromagnetic fields. Knowledge of the laws, regulations and relative norms to the management of the radioelecric spectrum. Capacity of realisation of a work in group and its oral and written presentation.	A5 A6 A7 A8 A9

Contents

Topic	
Introduction	Introduction to the matter. General concepts.
Spectrum management	National and international regulatory bodies International management and coordination National management The Telecommunications Law National telecommunication Plans CNAF
Spectrum engineering	Specifications of telecommunication equipmnet. Radio wave propagation. Coverage. Interferences. Re-use distance. Techniques to share the spectrum.
Modulations	Definitions The radio channel Objective of the modulation Types Analog Modulations: AM, FM Digital Modulations Wideband Modulations
Frequency planning	Trellis method List method Other methods Examples
Technical surveillance	The specrrum analyzer The wideband sounder measurement procedures for radioelectric base station certification
SMATV	Introduction Rules Design Examples
Structured wiring.	Introduction Rules Design Examples

Planning

	Class hours	Hours outside the classroom	Total hours
Laboratory practises	1	2	3
Tutored works	3	45	48
Practice in computer rooms	6	6	12
Outdoor study / field practices	11	11	22
Others	2	25	27
Master Session	19	19	38

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

Methodologies

	Description
Laboratory practises	Activities of application of the acquired knowledge to particular situations. Acquisition of basic skills related with the matter. Specific measurement equipment as Spectrum Analysers , Field level sounders, etc, will be used.
Tutored works	The student, alone or in a small group with other students, elaborates a report on a given subject. This includes the search of the information, reading, writting, etc
Practice in computer rooms	Activities of application of the acquired knowledge to particular situations. Acquisition of basic skills related with the matter using computer programs.
Outdoor study / field practices	Field activities. Activities of application of the acquired knowledge to particular situations. Acquisition of basic skills related with the matter. Specific measurement equipment as Spectrum Analysers , Field level sounders, etc, will be used.
Others	Written exam on the contents of the matter.
Master Session	Master lecture given by the teacher.

Personalized attention

Methodologies	Description

Master Session	The students will be able to resolve the doubts and questions of these types of teaching during the realisation of the activities, attending to scheduled meetings with the , or by means of email
Laboratory practises	The students will be able to resolve the doubts and questions of these types of teaching during the realisation of the activities, attending to scheduled meetings with the , or by means of email
Tutored works	The students will be able to resolve the doubts and questions of these types of teaching during the realisation of the activities, attending to scheduled meetings with the , or by means of email
Practice in computer rooms	The students will be able to resolve the doubts and questions of these types of teaching during the realisation of the activities, attending to scheduled meetings with the , or by means of email
Outdoor study / field practices	The students will be able to resolve the doubts and questions of these types of teaching during the realisation of the activities, attending to scheduled meetings with the , or by means of email

Assessment

	Description	Qualification
Laboratory practises	Realisation of measures on a panel of distribution of TV signal. Competences ST1 and ST5 will be evaluated.	2.5
Tutored works	Realisation of reports and presentations about issues related to spectrum management, that will be presented in class to evaluate the compentencie CG9.3 "Capacity to communicate, so much by writing as of oral form, knowledges, procedures, results and ideas related with the telecommunications and the electronics."	15
Practice in computer rooms	The coverage area of an AM station will be calculated. It will be evaluated with the memory of the practice. Competences CG6, CG9, ST1 and ST5 will be evaluated.	5
Outdoor study / field practices	Basic use of the spectrum analyser. Measure of the bandwidth of a FM signal. Measure of TDT signals. Installation of a parabolic antenna. Phase 1 and phase 2 measurements. Execution of the practice or test when finalising the practice. Competences CG5, CG7, ST1 and ST5 will be evaluated.	27.5
Others	Written exams of the contents of the matter. Competences CG6, CG7, CG8, ST1 and ST5 will be evaluated.	50

Other comments on the Evaluation

1)Following the guidelines of the degree we offer to the students two schemes of evaluation in the ordinary announcement, at the end of the semester: continuous assessment and final assessment. The students will have to opt by one of the two schemes before the delivery of the report of the first practice. To be able to opt to the continuous evaluation the student has to complete and deliver in term the exercises that will be proposed in the classes of theory.

a)Continuous assessment. The continuous assessment will be based on the report of the PC practice and the tests of the other seven practices. The work *will be assessed by means of the presentation in class. The last task of the continuous evaluation is a written exam. These tasks are not recoverable and only are valid for the current course.

b)Final evaluation. The students that do not opt to her continuous assessment will have to complete two written exams, one related to the theoretical contents (50%) and the other to the practical contents (50%) in the official date of examination.

2) Extraordinary announcement (July). The students that have previously opted by continuous assesment will be able to opt between repeating the written examinations (50% of the mark) or examine again of all the matter (100% of the mark) by means two written exams, one related to the theoretical contents (50%) and the other to the practical contents (50%). They will communicate the option they choose before the official date of the examination. The rest of the students will examine of all the matter (100% of the mark) by means two written exams, one related to the theoretical contents (50%) and the other to the practical contents (50%).

Sources of information

Internacional Telecomunication Union, **ITU-R recommendations**,

Internacional Telecomunication Union, **Radiocomunication Rules**,

Internacional Telecomunication Union, **National Spectrum management Manual**, 2005,

Gretel-COIT, **La evolución de la gestión del espectro radioeléctrico**, 2007,

Recommendations

Subjects that it is recommended to have taken before

Signal Transmission and Reception Techniques/V05G300V01404
Electromagnetic Transmission/V05G300V01303
Radio Communication Systems/V05G300V01512