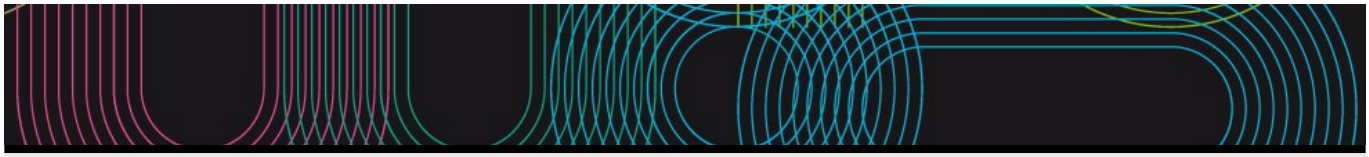

IDENTIFYING DATA				
Oceanographic remote sensing				
Subject	Oceanographic remote sensing			
Code	V10G060V01908			
Study programme	(*)Grao en Ciencias do Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language	Spanish			
Department				
Coordinator	Torres Palenzuela, Jesús Manuel			
Lecturers	Torres Palenzuela, Jesús Manuel			
E-mail	jesu@uvigo.es			
Web	http://www.tgis.uvigo.es			
General description	Introduction to the physical principles of the Teledetection and his Oceanographic Applications			

Competencies	
Code	
A1	Students have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study
A2	Students can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study
A5	Students have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy
C12	To be able to operate the instrumental techniques applied to sea
C18	To transmit writing, verbal and graphical information for audiences of various types
D4	Basic computing skills related to the field of study
D5	Information technology skills (search and data analysis)

Learning outcomes			
Expected results from this subject	Training and Learning Results		
Know the physical principles of the Teledetection and applications in the field of the Oceanography		C12	D4 D5
Learn to use programs of Treatment of Images of Satellite in marine applications.	A1 A2 A5	C18	D4

Contents	
Topic	
1.-INTRODUCTION To THE TELEDETECTION Pretend with this first subject enter to the student in the world of the teledetection and the paper that this plays in the modern oceanography.	1.1.- Teledetection in Oceanography 1.2.- Brief history of the space observation of the oceans 1.3.- Possibilities for the oceanography 1.4.- Temporary and space scales of the phenomena of interest.

2.- PHYSICAL PRINCIPLES OF THE TELEDETECTION In this unit pretends that the student know the principles of the physics of the electromagnetic radiation, his interaction with the atmosphere, as well as the spectral characteristics of the covers.	Objective Contents 2.1.- Radiation and electromagnetic spectrum. 2.2.- Terms and units of measure. 2.3.- Principles of the electromagnetic radiation. 2.4.- *Caractrísticas Spectral of the covers. 2.5.- Interaction of the atmosphere with the radiation. 2.5.1.- Absorption. 2.5.2.- Dispersion. 2.5.3.- Broadcast.
3.- ELEMENTS OF A SYSTEM OF TELEDETECTION: In this unit enters to the student in the characteristics that define to a sensor and space platform as well as the steps required from the capture of an image by a sensor until his application and utilisation by part of an user. Finally they describe the most used satellites.	Objective Contents: 3.1. System of reception of images Elements of the system Platform and sensor Orbits Resolution of a sensor Types of sensors Platforms
4.- *ANALISIS And DIGITAL TREATMENT OF IMAGES: In this unit establish the principles of visual and digital interpretation as well as the processing of the information with the object to delete errors (correction), improve some appearance of the information obtained (enhance) or obtain other parameters from the data of radiance (transformations). Finally it will enter to the student in the digital classification and the integration of information in systems of geographic information.	Objective Contents: 4.1. Visual analysis 4.1.1. Criteria of Interpretation 4.2. Digital treatment 4.2.1. Digital image 4.2.2. Corrections 4.2.3. It enhance 4.2.4. Transformations
5.- APPLICATIONS	Aims: In this last unit enumerate the applications of the teledetection in meteorology and study of the oceans. In each one of these applications realises a description of the physical principles that make it possible, as well as the interpretation of the results obtained and the sensors used.

Planning			
	Class hours	Hours outside the classroom	Total hours
Practices through ICT	20	10	30
Seminars	7	15	22
Lecturing	25	52	77
Laboratory practice	4	0	4
Essay	0	15	15
Problem and/or exercise solving	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
Practices through ICT	The methodology that uses in the practical is the one of study directed.
Seminars	There will be an individualized tracking techniques and content for the development of the scheduled jobs. Its main objective is to clarify the concepts that have been explained in the kind of theory or solve any of the problems of practical classes.
Lecturing	The lesson *magistral is the method mainly employee, using in the measure of the possible the lesson had a conversation.

Personalized assistance

Methodologies	Description
Lecturing	The master lesson is the method mainly employee, using in the measure of the possible the lesson had a conversation. Students willing so could attend personal tutorials to solve doubts and/or uncertainties, which will mainly take place during the timetables indicated. To better optimise the procedure, the student is requested to previously contact his/her teacher with reasonable anticipation
Practices through ICT	The methodology that uses in the practical is the one of study directed.
Seminars	It will realise a individualised follow-up of technicians and contents for the development of the works scheduled . His main aim is to clear the concepts that have been explained in the class of theory or resolve any of the problems of the practical classes.
Tests	**Description**
Essay	They will be works on subjects of applications of the teledetection in base to scientific publications and the matter of the subject

Assessment

	Description	Qualification	Training and Learning Results		
Practices through ICT	The methodology that uses in the practical is the one of study directed.	10-20	A1 A2	C12	
Seminars	It will realise a follow-up *individualizado of technicians and contents for the development of the works scheduled	0-5	A1 A2		D5
Lecturing	The lesson *magistral is the method mainly employee, using in the measure of the possible the lesson had a conversation.	0	A1 A2		
Laboratory practice	By his part, the practical examinations outline of particular use to the hour to evaluate the application of the knowledges purchased. So many theorists like practical. They comport difficulty of implementation regarding the available places for the same and to the necessary variety of examinations, but provide an excellent half for the assessment regarding the application of the knowledges.	20	A1 A2		D4
Essay	*Seran Assigned subjects by groups of two students	10-60	A1 A2	C12	D4 D5
Problem and/or exercise solving	The examination has to form part of a systematic evaluation, understood this as the one who obeys to a previously established programming and that does not realise of an occasional or incidental way. By means of the realisation of an examination pretends , generally, evaluate: * The knowledges that about a matter possesses the student. * The capacity of relation of some knowledges with others. * The application of the knowledges to the resolution of concrete problems.	60-0	A1 A2 A5	C12	

Other comments on the Evaluation

Date, time and place of exams will be published in the official web of Marine Sciences Faculty: http://mar.uvigo.es/index.php/en/alumnado-actual-2/examenes-3

Students are strongly requested to fulfil a honest and responsible behaviour. It is considered completely unacceptable any alteration or fraud (i.e., copy or plagiarism) contributing to modify the level of knowledge and abilities acquired in exams, evaluations, reports or any kind of teacher□s proposed work. Fraudulent behaviour may cause failing the course for a whole academic year. An internal dossier of these activities will be built and, when reoffending, the university rectorate will be asked to open a disciplinary record

Sources of information

Basic Bibliography

Oceanografía y Satélites, Tebar, 2009

CRACKNELL, A.P. u HAYES, L.W.B., **Introduction to Remote Sensing**, Taylo & Francis, 1991

Complementary Bibliography

Recommendations

Subjects that are recommended to be taken simultaneously

Geographic analysis methods/V10G060V01904

Other comments

Date, time and place of exams will be published in the official web of Marine Sciences Faculty:

http://mar.uvigo.es/index.php/en/alumnado-actual-2/examenes-3

Contingency plan

Description

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===
* educational Methodologies that keep
All
* educational Methodologies that modify
Any
* no face-to-face Mechanism of attention to the students (*tutorías)
By post, virtual classroom and *Faitic
* Modifications (if they proceed) of the contents to give
does not proceed
* additional Bibliography to facilitate the car-learning
does not proceed
* Other modifications

=== ADAPTATION OF THE EVALUATION ===
* Test already made
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
keep percentages

* Test slopes that keep
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
keep percentages

* Test that they modify
Any

* New proofs
Any

* additional Information
Any