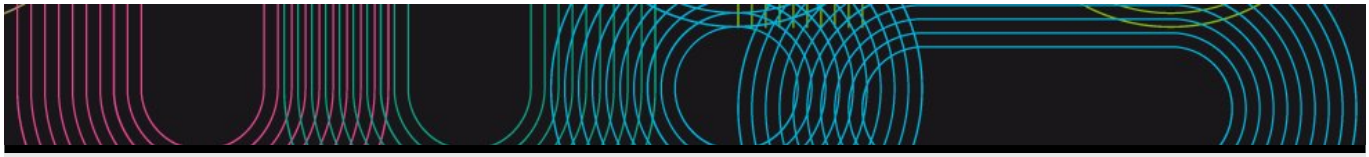

IDENTIFYING DATA				
Geological oceanography I				
Subject	Geological oceanography I			
Code	V10G060V01504			
Study programme	(*)Grao en Ciencias do Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	Spanish			
Department				
Coordinator	Bernabéu Tello, Ana María			
Lecturers	Alejo Flores, Irene Bernabéu Tello, Ana María Marino , Gianluca			
E-mail	bernabeu@uvigo.es			
Web	http://193.146.32.240/tema1112/claroline/course/index.php			
General description	Geological oceanography (also called marine geology) is one of the broadest fields in the Earth Sciences and contains many subdisciplines, including geophysics, and plate tectonics, petrology and geochemistry, sedimentation processes, and micropaleontology and stratigraphy. Geological Oceanography I will focus on the study of basic earth proceses affecting sedimentation in litoral areas, since sediments are the main geological feature of these region. The subject will cover the fundamental techniques to study the topography, structure, sedimentation, and associated geological processes of these areas to discover how they were formed and how ongoing processes (coastal dynamics, climate change, human impact...) may change them in the future. The subject will deal with the peculiarity of combining terrestrial and marine data to study litoral and coastal processes.			

Competencies	
Code	
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
C1	To know the vocabulary, codes and concepts inherent to the oceanographic scientific field
C2	To know and understand the essential facts, concepts, principles and theories related to oceanography
C5	Basic knowledge of research methodology in oceanography
C6	Ability to identify and understand the problems in the field of oceanography
C13	To acquire, evaluate, process and interpret oceanographic data within the theories currently in use
C16	To plan, design and implement applied research from the recognition stage to the final evaluation of results and discoveries
C17	Ability to survey in the field and to work in the laboratory responsibly and safely, encouraging team work
D6	Problem management and solving skills
D16	Research skills

Learning outcomes			
Expected results from this subject	Training and Learning Results		
2. Capacity to manage the basic techniques of observation, meassurement and description of marine geological materials in these environments	A2 A5	C1 C2 C5 C13 C17	D6 D16

3. Capacity to manage the basic techniques of sampling and surveying	A2	C1 C5 C13 C17	D16
4. Capacity to manage the basic techniques of sediment caracterización and analyses	A2 A5	C1 C2 C5 C6	D6 D16
5. Geological mapping and representation skills	A2 A5	C1 C5 C6 C16	D16
6. Report elaboration and presentation skills	A2 A5	C1 C6 C16	D16

Contents	
Topic	
T0. Presentation	0.1 Aims 0.2 Activities 0.3 Program 0.4 System of qualification
T1. Introduction	1.1 History and development of Marine Geology 1.2 Importance of Marine Geology
T2. General protocol for geological research on the coast and nearshore	2.1 Nature of Research and project design 2.2 General protocol for design and execution of a project 2.3 Planning and definition of methodological strategies 2.4 Data evaluation, interpretation and publication
T3. Coastal Morphodynamics	3.1 Basic concepts 3.2 Morphodynamics of coastal systems 3.3 Transport assessment
T4 Methods of sampling and subsampling	4.1 Grabbers 4.2 Corers 4.3 Fluids and gases 4.4 Samples curation
T5. Seismo-acoustic methods	5.1 Basic Principles 5.2 Echosounders 5.3 Side Scan Sonar 5.4 Seismic Methods (HR) 5.5 Processing
T6. Electrical logging: physical properties (seminars)	6.1 Gamma density and natural gamma 6.2 Resistivity and poropermeability 6.3 Susceptibility and other magnetic properties 6.4 Color and imaging 6.5 X-Rays 6.6 Corescanning: GEOTEK and 2G
T7 Geochemical Methods (seminars)	7.1 Elemental analyses 7.1.1 LECO 7.1.2 Spectrometry 7.1.3 XRF 7.2 Mineralogical Analyses 7.2.1 XRD 7.2.2 SEM-EDAX 7.3 Corescanning: ITRAX and AVAATECH
T8 Dating Techniques	8.1 Radiometry 8.1.1 14C 8.1.2 210Pb 8.1.3 137Cs 8.2 Other Methods 8.2.1 d18O 8.2.2 Magnetic 8.2.3 Thermoluminescence

PA1 Survey Planning	How to plan a cruise (practical case) PA1.1 Objective definition PA1.2 Selection of methodologies PA1.3 Definition of tasks and scope PA1.4 Time Planning PA1.5 Economic assessment and budgets PA1.6 Reports
PA2 RV Mytilus Mini Cruise	PA2.1 Administrative requirements and basic security norms in oceanographic cruises PA2.2 Onboard life PA2.3 Sediment sampling techniques and operations PA2.4 Geophysical surveying techniques and operations PA2.5 Data management and archives

Planning			
	Class hours	Hours outside the classroom	Total hours
Seminars	7	9	16
Studies excursion	5	5	10
Introductory activities	2	4	6
Case studies	15	30	45
Lecturing	23	48	71
Essay questions exam	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
Seminars	2:20 h long seminars on complementary topics
Studies excursion	It includes ship minicruises oriented to experience oceanographic work in real conditions
Introductory activities	It comprises the activities carried out during the two first lectures, like subject presentation, time schedule, qualification procedures and other pertinent indications for the course well-being.
Case studies	Preparation of a project in real terms: analysis of the problematic, definition of aims, methodological planning, timing and economic estimate.
Lecturing	Lectures comprising the major topics of the course program

Personalized assistance	
Methodologies	**Description**
Lecturing	The tutorials will take place preferably on Monday and Thursday from 12:00 to 14:00 The tutoring sessions may be carried out by telematic means (email, videoconference, FAITIC forums, ...) under the modality of prior agreement. In the face-to-face modality, the tutorials will be held in office D42, block C, 3rd floor of the CC Experimental Building, as long as the teacher does not have to attend to other academic obligations. To optimize the time, it is necessary for the student to contact the teacher in advance
Seminars	The tutorials will take place preferably on Monday and Thursday from 12:00 to 14:00 The tutoring sessions may be carried out by telematic means (email, videoconference, FAITIC forums, ...) under the modality of prior agreement. In the face-to-face modality, the tutorials will be held in office D42, block C, 3rd floor of the CC Experimental Building, as long as the teacher does not have to attend to other academic obligations. To optimize the time, it is necessary for the student to contact the teacher in advance
Studies excursion	The tutorials will take place preferably on Monday and Thursday from 12:00 to 14:00 The tutoring sessions may be carried out by telematic means (email, videoconference, FAITIC forums, ...) under the modality of prior agreement. In the face-to-face modality, the tutorials will be held in office D42, block C, 3rd floor of the CC Experimental Building, as long as the teacher does not have to attend to other academic obligations. To optimize the time, it is necessary for the student to contact the teacher in advance
Introductory activities	The tutorials will take place preferably on Monday and Thursday from 12:00 to 14:00 The tutoring sessions may be carried out by telematic means (email, videoconference, FAITIC forums, ...) under the modality of prior agreement. In the face-to-face modality, the tutorials will be held in office D42, block C, 3rd floor of the CC Experimental Building, as long as the teacher does not have to attend to other academic obligations. To optimize the time, it is necessary for the student to contact the teacher in advance

Case studies	The tutorials will take place preferably on Monday and Thursday from 12:00 to 14:00 The tutoring sessions may be carried out by telematic means (email, videoconference, FAITIC forums, ...) under the modality of prior agreement. In the face-to-face modality, the tutorials will be held in office D42, block C, 3rd floor of the CC Experimental Building, as long as the teacher does not have to attend to other academic obligations. To optimize the time, it is necessary for the student to contact the teacher in advance

Assessment

	Description	Qualification	Training and Learning Results		
Seminars	Individual written report on the seminar activities. May include tests.	10	A2	C1 C5 C13 C16 C17	D6 D16
Studies excursion	It comprises an individual brief written summary. It has to reflect the activities performed in the field trip.	10	A2	C1 C5 C13 C16 C17	D16
Case studies	Group report that comprise the practical activities, including objectives, methodology, results and conclusions	10 ó 20	A2	C5 C13 C16	D16
Lecturing	Written individual test of 2 to 4 hours, whose aim will be the global evaluation of the process of learning and the acquisition of skills and knowledge. It will comprise one or several of the following types of assessments: long questions to elaborate, short questions, tests, problem resolution, interpretation of images, maps and diagrams. It will require a minimum of 4 over 10 to be able to compute with the rest of evaluation elements.	60	A2 A5	C1 C2 C6	D6
Essay questions exam	Individual written report on an additional activity derived from the lectures, practicals or seminars, pursuing the students own interest. It does not have compulsory character. Its execution takes 10% off the laboratory practicals.	10 ó 0	A2 A5	C1 C2 C5 C6	D6

Other comments on the Evaluation

The attendance to the field trip, seminars and practical is compulsory. A 20% or more of absence of attendance in the lectures or the non-attendance to a field trip will automatically disqualify. It is necessary to attain at least 40% of the maximum mark in each block to compensate. If one of the methodologies is not qualified, the final qualification will be the pure average divided by 2.

Students failing the course will have to retake all the parts the following year.

The official exam dates will be available at: http://mar.uvigo.es/index.php/en/alumnado-actual-2/examenes-3

The students are strongly asked to fulfill a honest and responsible behavior.

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

E.A. Hailwood, R. Kidd, **Marine Geological Surveying and Sampling**, 978-94-010-6763-8 (Print) 978-94-009-0615-0 (Online), Springer, 1990

E. J. W. Jones, **Marine Geophysics**, 978-0-471-98694-2, Wiley, 1999

Horst D. Schulz, Matthias Zabel, **Marine Geochemistry**, 978-3-540-32143-9 (Print) 978-3-540-32144-6 (Online), Springer, 2006

M. E. Tucker, **Techniques in Sedimentology**, 978-0632013722, Wiley-Blackwell, 1991

Bernabeu, A.M., Abilleira, P., Fernández-Fernández, S., Lersundi-Campistegui, A. V., **Capítulo XXIX. Métodos para la evaluación del transporte de sedimentos en el litoral. En: Métodos Y Tecnicas En Investigacion Marina**, 9788430952083, TECNOS, 2011

K Mohamed, D. Rey, **Capítulo XXX. Técnicas de magnetismo ambiental de utilidad en el estudio de sedimentos marinos. En: En: Métodos Y Tecnicas En Investigacion Marina**, 9788430952083, TECNOS, 2011

B. Rubio, D. Rey, A.M. Bernabeu, F. Vilas, I. Rodríguez Germade, A. Ares, **Capítulo XXXI. Nuevas técnicas de obtención de datos geoquímicos de alta resolución. En: Métodos Y Tecnicas En Investigacion Marina**, 9788430952083, TECNOS, 2011

Complementary Bibliography

http://walrus.wr.usgs.gov/pubinfo/margeol2.html,

Comission of marine cartography, **http://www.shoa.cl/ica/index.html**,

GEODAS Geophysical Data Management System of the NOAA National Geophysical Data Center (NGDC), **http://www.ngdc.noaa.gov/mgg/geodas/geodas.html**,

Recommendations

Subjects that continue the syllabus

Geological oceanography II/V10G060V01603

Subjects that are recommended to be taken simultaneously

(*)/
Physical oceanography I/V10G060V01503

Subjects that it is recommended to have taken before

(*)/

Other comments

DELIVERY OF ASSIGNMENTS
Unless it is stated otherwise, all the hand outs have to be delivered in electronic format and uploaded to the TEMA platform. No email, or paper submission will be accepted or acknowledged.
IMPORTANT
All deadlines expire at 24:00 of the marked day.
REGARDING THE AUTHORSHIP OF THE GROUP ASSIGNMENTS
Submission of the assignment is the responsibility of the coordinator, who must state the participants. All coauthors must upload their copy at FAITIC to claim co-authorship.
Authorship cannot be modified after the deadline of the assignment.
Authors that appear in more than one assignment will cause the assignment to fail for all authors.
Plagiarism, partly or in whole, will cause course to fail and will be reported to the Dean for disciplinary action.
THE TEMA PLATFORM IS THE OFFICIAL COMMUNICATION CHANNEL OF THE COURSE
Any agreement has to be stated in the TEMA platform to be official.

Contingency plan

Description

In the case of having to assume mixed teaching or teaching completely online, the training activities will be modified as follows:

1. Theoretical classes: they will be taught through the Campus Remoto

2. Practical classes: They will be taught through the Campus Remoto

3. Field trip: information and audiovisual resources will be given to students related to the content and learning outcomes associated with this methodology.

4. Seminars: They will be taught through Campus Remoto with additional supporting information

Regarding the assessment of the subject, it will be modified increasing the weight in the final grade of the continuous evaluation. The distribution of% will be as follows:

1. Theoretical contents:
Exam 20%
Continuous assessment 20%

2. Practical content: 25%

Group report reflecting the activities
made during the practices, which will include
objectives, methodology, results and conclusions

3. Field trip: 15%
Includes an individual written report of the
material and information provided

4. Seminars: 20%
Individual written report on the activity carried out in
seminars. May include questionnaires.