



IDENTIFYING DATA

Sedimentology

Subject	Sedimentology			
Code	V10G060V01305			
Study programme	(*)Grao en Ciencias do Mar			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	2nd	1st
Teaching language	Spanish English			
Department				
Coordinator	Rey García, Daniel			
Lecturers	Bernabéu Tello, Ana María Rey García, Daniel			
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General description	The matter sedimentology forms part of the basic knowledges in Marine Geology needed to obtain a suitable understanding of the half marine. Their outlines indicate that it treats of the study of the marine sediments and of their processes of formation, erosion, transport and sedimentation.			

It contributes knowledges on the methods, technicians of study and recognition of the distinct types of sediments and sedimentary rocks. These are the key for the analysis of facies and of sequences and the paleoenvironmental interpretation (ie paleoclimate), as well as interpret the register in the prospection of natural resources.

Comprise the importance of the marine sediments and his relation with the physical processes, chemists, biological and hydrodynamic own of this half, is key to interpret the answer of the half to the action of usual dynamic processes, eventual or been due to the human intervention.

Their study will contribute knowledges on the processes, evolution and predictable tendencies of the marine environment in front of the changes, natural or antrophic, through the knowledge of the sedimentary record.

In a wider sense, their multidisciplinary character contributes applicable knowledges for example to the management and interpretation of natural spaces, studies of coastal pollution, etc. This subject constitutes the base and/or enters to the basic foundations for the knowledge of the marine and coastalsedimentary environments that give in the following semester, as well as the Geological Oceanography I and II of the following course. These basic knowledges here purchased will be expanded and applied in the optative matter Analysis of Basins, that the students can choose in the following course.

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
C12	To be able to operate the instrumental techniques applied to sea
C13	To acquire, evaluate, process and interpret oceanographic data within the theories currently in use
C15	To recognize and implement good scientific practice in measurement and experimentation, both in the field and in the laboratory
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
C18	To transmit writing, verbal and graphical information for audiences of various types
D1	Analysis and synthesis ability
D2	Organization and planning skills
D3	Written and oral communication in the official languages of the University
D5	Information technology skills (search and data analysis)
D6	Problem management and solving skills
D8	Teamwork ability
D11	Ability to learn independently and continuously
D15	Ability to apply knowledge in practice
D16	Research skills

Learning outcomes

Expected results from this subject	Training and Learning Results		
1. Recognise and identify the different types of sediments	A5	C1 C5 C12 C15 C17 C18	D3 D11 D15 D16
2. Know characterise textural and mineralogically the sediments	A5	C1 C5 C12 C15 C17 C18	D3 D15 D16
3. Recognise and identify sedimentary structures	A5	C1 C5 C12 C15 C17 C18	D3 D15 D16
4. Relate the sedimentary structures with their process of formation	A5	C2 C6 C13 C15	D1 D5 D6 D15 D16
5. Dominate the sedimentary processes of erosion, transport and deposition	A5	C5 C12 C15 C17 C18	D1 D11 D15 D16
6. Characterise the relations of geochemical exchange between seawater and sediment	A5	C1 C5 C12 C13 C15 C17 C18	D5 D15 D16
7. Recognise postdepositional transformations in the sediments	A5	C1 C6 C12 C13 C15 C18	D1 D11 D15 D16
8. Interpret the sedimentological data	A5	C1 C2 C6 C12 C13 C15 C18	D1 D5 D6 D15 D16

9. Understand the factors that control the sedimentation in the marine environment	A5	C2 C6 C13 C17 C18	D1 D3 D5 D6 D11 D15 D16
10. Know the concept of facies, depositional environment and sequence	A5	C1 C2 C6 C13 C18	D1 D5 D6 D11 D15 D16
14. Deduce the evolutionary and dynamic tendencies of the environments, through the sedimentological analysis	A5	C2 C6 C13 C18	D1 D5 D6 D11 D15 D16
15. Acquire skill in the application of methods and realisation of works in the marine environment	A2 A5	C1 C5 C6 C12 C13 C16 C17 C18	D1 D2 D5 D11 D15 D16
16. Apply the knowledges purchased to the resolution of problems in the half marine	A2 A5	C2 C5 C6 C12 C16 C17 C18	D1 D2 D5 D6 D8 D11 D15 D16

Contents

Topic

TOPIC 0. PRESENTATION OF THE SUBJECT	0.1. Aims of the subject 0.2. Theoretical contents: master lessons 0.3. fieldwork and laboratory work 0.4. Seminars 0.5. on-line exercises 0.6. Personalised tutorials 0.7. Evaluation
TOPIC 1: INTRODUCTION TO THE SEDIMENTOLOGY	1.1. Importance of sediments and sedimentary rocks 1.2. The geological cycle 1.3. Notions of source, reservoir, flow and sink; time of residence 1.4. Tectonics, climate and sedimentation 1.5. Techniques and methods in Sedimentology
TOPIC 2: SILICICLASTIC SEDIMENTS	2.1. Description: texture and structure. 2.2. Classification according to size. 2.3. Form. 2.4. Origin, composition. 2.5. Classification according to the composition. 2.6. The concept of textural and compositional maturity 2.7. Climatic and tectonic forcings 2.8. Diagenesis of siliciclastics
TOPIC 3: PROPERTIES OF THE GRAINS	3.1. Size distribution 3.2. Factory and texture. Porosity and permeability. 3.3. Background forms 3.4. Sedimentary structures 3.5. Temporal scale of the processes and spatial record.

TOPIC 4: GENERAL CHARACTERISTICS OF THE FLUID AND OF THE FLOW	4.1. Transport environments 4.2. Physical properties of the fluids: 4.3. Fluids in movement: laminar and turbulent Flows, Boundary Layer; Effect of the bottom 4.4. Types of flow: Unidirectional, Oscillatory, Gravitational, Licuefactated
TOPIC 5: TRANSPORT OF SEDIMENT AND BOTTOM FORMS	5.1. Initiation of motion: Critical shear stress, Effects of the size and density of the sediment, Effects of the biological activity, Peculiarity for cohesives sediments. 5.2. Sediment transport: modes of transport, transport rate. 5.3. Sedimentation of particles: In a static fluid (Stokes Law), In natural flows (Drag coefficient) 5.4. Bottom forms under unidirectional flows: Terminology, Sequence of bottom forms; Stability 5.5. Cross-stratification by background forms: Terminology, Types, bottom forms under oscillatory flows, Stability and relation with the flow regime, Types of stratification
TOPIC 6: CARBONATIC SEDIMENTS	6.1. Generalities. Composition and mineralogy. Balance of the CaCO ₃ the oceans. The lisocline, CCD and the spatial and temporal distribution of the carbonatic sediments. 6.2. Alochemical carbonatic constituents 6.3. Ortochemical carbntatic constituents 6.4. Classification of carbonatic rocks and sedimentary environments. 6.5. Carbonatic sedimentary systems 6.6. Diagenesis of the sediments and carbonatic rocks.
TOPIC 7: OTHER SEDIMENTS	7.1. Siliceous sediments 7.2. Modern and ancient evaporitic sediments. Halite, Gypsum and Anhidrite. 7.3. Volcanic tephras: Origin and relation with the volcanism. Recognition and importance in marine series.
TOPIC 8: FACIES ANALYSIS	9.1. Facies: Concept and Types 9.2. Facies association 9.3. Ciclicity, rhythms and their origin 9.4. correlations
BLOCK OF SEMINARS	1. grain size (part 1) and form 2. grain size (part 2) 3. Hydrodynamics
LABORATORY PRACTICAL	1. Optical petrology
FIELDWORK	1. Fieldtrip Southern Margin Ría of Vigo 2. Fieldtrip Beaches of Montalvo and Pociñas

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	25	40	65
Outdoor study / field practices	14	10	24
Laboratory practises	6	0	6
Presentations / exhibitions	0.25	1.75	2
Tutored works	0	15	15
Seminars	7	15	22
Group tutoring	0	9	9
Long answer tests and development	0	3	3
Short answer tests	0	1	1
Multiple choice tests	0	1	1
Reports / memories of practice	0	2	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	It comprises the 8 subjects that will teach during the theoretical classes. It reserves some flexibility in the extension of the last topics, to be able to stress on new questions of interest that can appear during the course.
Outdoor study / field practices	It includes the 2 fieldtrips of 7 hours to carry out direct observations on specific sedimentation environments and evaluate their sedimetological characteristics.
Laboratory practises	Laboratory practice of 5 hours on petrographic microscope as a fundamental tool of petrographic diagnostic

Presentations / exhibitions	Short presentations on questions from the theoretical classes, seminars and fieldtrips
Tutored works	Reports to present after the seminars, laboratory and fieldtrips
Seminars	Practical- theoretical classes of 2:20 h in the laboratory.
Group tutoring	Activities associated to the practical-theoretical works

Personalized attention

Methodologies	Description
Master Session	The doubts will be attended in the schedule of tutorials: Monday to Friday of 13:00 to 14:00, whenever the professor do not have to attend other educational obligations
Group tutoring	The doubts will be attended in the schedule of tutorials: Monday to Friday of 13:00 to 14:00, whenever the professor do not have to attend other educational obligations
Tutored works	The doubts will be attended in the schedule of tutorials: Monday to Friday of 13:00 to 14:00, whenever the professor do not have to attend other educational obligations

Assessment

	Description	Qualification	Training and Learning Results	
Master Session	Written exam composed mostly of short questions, but that it can contain some question that demand a wider development, the resolution of a problem, or the interpretation of images and diagrams	60	A2 A5	C1 D1 C2 D2 C5 D3 C6 D6 C18 D11
Outdoor study / field practices	Report of the fieldtrips	10	A2	C1 D1 C5 D2 C12 D5 C13 D8 C15 D15 C16 D16 C17
Laboratory practises	Written report of the activity done in seminars and laboratory practices	20	A2	C1 D2 C5 D3 C12 D5 C13 D6 C15 D8 C16 D15 C17 D16
Presentations / exhibitions	Assessment of the exhibition of the works of the seminars, optional activity	10	A2 A5	C1 D1 C2 D2 C6 D3 C18 D5 D8 D16

Other comments on the Evaluation

The attendance to the fieldtrips, seminars and laboratory practices is indispensable condition to be described. 20% faults of assistance in the group of the activities of the subject, or the no assistance to an exit involve the no qualification. If one of the parts is not described, the note that will assign will be the pure average divided by 2.

It is necessary to reach at least 40% of the partial maximum punctuation in each one of blocks to be able to compensate doing half with the qualification obtained in the others blocks.

If any student reaches the half note of 9, will consider the possibility to celebrate an additional proof to go up note, to which will be invited at most the 4 students with better qualification that have surpassed the 7,5.

If it does not surpass the subject, does not conserve the qualification obtained in the blocks for the following course.

Sources of information

Tucker, M. E., **Sedimentary Petrology. An Introduction to the origin of sedimentary rocks.**, 2001,
Tucker, M., **Techniques in Sedimentology**, 1988,
<http://www.iasnet.org/>,
Arche, A, **Sedimentología**, 2010,
Allen, J., **Principles of Physical Sedimentology**, 1985,

Recommendations

Subjects that continue the syllabus

Coastal and marine sedimentary habitats/V10G060V01402

Subjects that are recommended to be taken simultaneously

Mathematics: Mathematics II/V10G060V01203

Subjects that it is recommended to have taken before

Geology: Geology 1/V10G060V01105

Geology: Geology 2/V10G060V01205

Other comments

REMINDER FORM OF QUALIFICATION

It is emphasized that assistance to classroom activities and practicals is mandatory. When attendance is below 80% the student will not be qualified. Field and ship trips are compulsory and demand 100% attendance.

Every student must reach at least 40% of the maximum partial score in each block to compensate with the score on the other blocks.

No partial block score will be kept for the next year.

DELIVERY FORMATS

Unless stated otherwise all submission are to be made electronically by uploading them to the TEMA platform. Submissions will not be accepted by email, or in paper.

REGARDING THE DEADLINES

It is important to have in mind that submissions deadlines are fixed. Every submission have to be made within a week of completing the activity. All deadlines expire at 24:00 of the day indicated. No submission will be allowed beyond the deadline.

AUTHORSHIP

Submission of team work is the responsibility of the student who acts as coordinator. This affects the number of co-authors (if a limit is set), the contribution of each co-author (if any is repeated or missing) and the deadline.

No authors can be added after the essay has been submitted.

Authors repeated in more than one essay will not be accepted.

No plagiarized papers, in part or in full, will be accepted

THE PLATFORM TEMA IS THE OFFICIAL COMMUNICATION MEDIA

TEMA communications will always prevail over any other communication.

HONORABILITY

It is expected that the students who pursue this matter to take a responsible and honest conduct.

It is deemed inadmissible any form of fraud (i.e. copy and / or plagiarism) aimed to distort the level of knowledge or skill achieved by a student in any type of test, work or report designed for this purpose. This fraudulent conduct will be punished with firmness and rigor established in current regulations.
