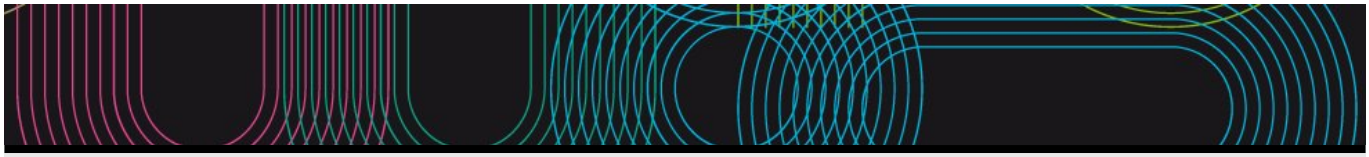

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Basin Analysis** | | | | |
| Subject | Basin Analysis | | | |
| Code | V10G060V01901 | | | |
| Study programme | (*)Grao en Ciencias do Mar | | | |
| Descriptors | ECTS Credits | Choose | Year | Quadmester |
| | 6 | Optional | 3rd | 2nd |
| Teaching language | Spanish | | | |
| Department | | | | |
| Coordinator | García Gil, María Soledad | | | |
| Lecturers | Francés Pedraz, Guillermo<br>García Gil, María Soledad<br>Pérez Arlucea, Marta María | | | |
| E-mail | sgil@uvigo.es | | | |
| Web | http://http://webs.uvigo.es/c10/webc10/ | | | |
| General description | This matter allows the introduction to the analysis of sedimentary basins and of the interpretation of the history of his filling using technical multidisciplinary. | | | |

| Competencies | |
|---|---|
| Code | |
| A3 | Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical issues |
| A4 | Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences |
| 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 |
| C14 | To recognize and analyze new problems and to propose problem-solving strategies |
| C16 | To plan, design and implement applied research from the recognition stage to the final evaluation of results and discoveries |
| C18 | To transmit writing, verbal and graphical information for audiences of various types |
| C19 | To map and characterize the seabed and the underground in marine and coastal areas |
| D1 | Analysis and synthesis ability |
| D6 | Problem management and solving skills |
| D15 | Ability to apply knowledge in practice |

| Learning outcomes | | | |
|---|---|---|---|
| Expected results from this subject | Training and Learning Results | | |
| Recognise and analyse new problems in the analysis of basins and propose new interpretations | | C14 | D6 |
| Schedule, design and execute investigations applied of the analysis of basins from the stage of recognition until the evaluation of results-geological resources. | | C16 | D1<br>D6<br>D15 |
| Transmit information of form written, verbal and graphic for audiences of diverse types | A4 | C18 | D1 |
| Caracterice and mapping of marine bottoms, marine sub-bottoms and coastal areas-continental | | C19 | D6<br>D15 |
| Interpretation of paleoceanographic proxies | A3<br>A4 | C1<br>C2<br>C5<br>C14<br>C18 | D1<br>D6<br>D15 |

| Contents |
|---|
| Topic |

| | |
|---|---|
| SUBJECT 1. INTRODUCTION TO THE ANALYSIS OF BASINS | 1.1. Definitions. Sedimentary basins. Classification<br>1.2. Origin and evolution of the oceanic basins<br>1.3. Interest and applications of the analysis of basins |
| SUBJECT 2. EXTERNAL AND INTERNAL FACTORS CONTROLLING THE EVOLUTION OF THE SEDIMENTARY BASINS | 2.1. Tectonics, Climate, Supply and Sea-level changes<br>2.2. Sequential stratigraphy: Types of sections, 3D architecture of facies and correlation criteria |
| SUBJECT 3. DATING METHODS | 3.1. Introduction to dating methods.<br>3.2. Methods of dating in the Quaternary |
| SUBJECT 4. SEISMIC STRATIGRAPHY | 4.1. Sedimentary discontinuity surfaces: Criteria of recognition<br>4.2. System tracks in the cycle of se-level oscillation<br>4.3.Sequences and models of sequences. |
| SUBJECT 5. PALEOCEANOGRAPHY AND PALAEOCLIMATOLOGY | 5.1. Palaeoceanography and plaeoclimatology proxies<br>5.2. Natural mechanisms of climatic and oceanographic changes |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 18 | 27 | 45 |
| Case studies | 15 | 30 | 45 |
| Seminars | 14 | 14 | 28 |
| Report of practices, practicum and external practices | 5 | 25 | 30 |
| Objective 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 |
|---|---|
| Lecturing | Presentations of the theoretical concepts that allow the students to adquire or improve the skills to perform the analysis of sedimentary basins. This involves the relationship of multidisciplinary theoretical concepts.<br>The classes will be of 1h. |
| Case studies | Each student will have several real seismic profiles corresponding to a sedimentary basin. They will have to perform the interpretation of each one and to elaborate an individual memory explaining the evolution of the basin. 4 practices of 5h |
| Seminars | The contents of the master sessions will be practiced with different exercises (recognition of sedimentary basins types in different marine contexts, stratigraphic surfaces, system tracks, signals that allow to identify sea-level variations, identification of the presence of gas/oil, dating of sediments and geological and paleoceanographic events. Paleoceanographic reconstruction of basins.<br>They will be 7 theoretical seminars-practical of 2h each one |

**Personalized assistance**

| **Methodologies** | **Description** |
|---|---|
| Lecturing | Students that wish it will be able to attend to personalized tutorials to resolve doubts, mainly in the indicated schedules. To optimize time, it is necessary that the student to contact with the lecturer previously. The tutorials will be able to be individual or in group in accordance with the schedules of the lecturer: Prof. Soledad García Gil (Tuesday and Thursday: 11 - 14 h) that would be modified according to educational needs. |
| Seminars | Students that wish it will be able to attend to personalized tutorials to resolve doubts, mainly in the indicated schedules. To optimize time, it is necessary that the student to contact with the lecturer previously. The tutorials will be able to be individual or in group in accordance with the schedules of the lecturer: Prof. Soledad García Gil (Tuesday and Thursday: 11 - 14 h) that would be modified according to educational needs. |
| Case studies | Students that wish it will be able to attend to personalized tutorials to resolve doubts, mainly in the indicated schedules. To optimize time, it is necessary that the student to contact with the lecturer previously. The tutorials will be able to be individual or in group in accordance with the schedules of the lecturer: Prof. Soledad García Gil (Tuesday and Thursday: 11 - 14 h) that would be modified according to educational needs. |
| **Tests** | **Description** |
| Report of practices, practicum and external practices | Students that wish it will be able to attend to personalized tutorials to resolve doubts, mainly in the indicated schedules. To optimize time, it is necessary that the student to contact with the lecturer previously. The tutorials will be able to be individual or in group in accordance with the schedules of the lecturer: Prof. Soledad García Gil (Tuesday and Thursday: 11 - 14 h) that would be modified according to educational needs. |

## Assessment

| | Description | Qualification | Training and Learning Results | |
|---|---|---|---|---|
| Case studies | Sequential seismic analysis of a sedimentary basin from the interpretation of seismic records and profiles. | 30 | C14<br>C16<br>C18<br>C19 | D1<br>D6<br>D15 |
| Seminars | Reports of Seminars | 30 | C5<br>C14<br>C18<br>C19 | D1<br>D6<br>D15 |
| Report of practices, practicum and external practices | Report/memory of work on the study of a real sedimentary basin. | 10 | C14<br>C16<br>C18<br>C19 | D1<br>D6<br>D15 |
| Objective questions exam | Exam with short answer questions on theory and practical topics. | 30 | A3<br>A4<br>C14<br>C16<br>C18<br>C19 | D1<br>D15 |

## 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


Rogers, J.W. y Santosh, M., **Continents and supercontinents**, 1, Oxford University Press, 2004

Allen, P.A. y Allen, J.R., **Basin Analysis: Principles and Application to Petroleum Play Assessment**, 3rd, Wiley-Blackwell, 2013

Walker, M., **Quaternary dating methods**, 1, Wiley-Blackwell, 2005

Shanmugam, G., **Deep-Water Processes and Facies Models: Implications for sandstone petroleum reservoirs**, 1, Elsevier, 2006

Treitel, S. y Helbig, K., **Handbook of Geophysical Exploration: Seismic Exploration**, 1, Elsevier, 2011

Huneke, H. y Mulder, T., **Deep-Sea Sediments**, 1, Elsevier, 2010

Catuneanu, O., **Principles of Sequence Stratigraphy**, 1, Elsevier, 2006


### Complementary Bibliography


Leeder, M.R. y Pérez-Arlucea, M., **Physical processes in Earth and environmental sciences**, 1, Wiley, 2006


## Recommendations

### Subjects that continue the syllabus

Applied marine geology/V10G060V01909
Final Year Dissertation/V10G060V01991

### Subjects that are recommended to be taken simultaneously

Geological oceanography II/V10G060V01603

### Subjects that it is recommended to have taken before

(*)/
Geological oceanography I/V10G060V01504

## Contingency plan

### Description

=== EXCEPTIONAL PLANNED MEASURES ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University has established an extraordinary planning that will be activated when the administrations and the institution itself determine it in accordance with the criteria of safety, health and responsibility, and guaranteeing teaching in a non-face-to-face or totally non-face-to-

face scenario. These already planned measures guarantee, when required, the development of teaching in a more agile and effective way so that students and teachers know them in advance (or well in advance) through the standardized and institutionalized tool of the DOCNET teaching guides.
=== ADAPTATION OF METHODOLOGIES ===
* Teaching methodologies that are maintained
1.- Mixed education: maintained
2.- Non-attendance teaching: they will be adapted to the available resources.
* Teaching methodologies that change
1.- Mixed education: do not change
2.- Non-attendance teaching: they will be adapted to the available resources.
* Non-attendance mechanism for the attention of students (* tutorials)
1.- Mixed teaching: prior agreement by email, face-to-face and/or virtual through Remote Campus.
2.- Non-attendance teaching: previous agreement by e-mail, virtual through Remote Campus
* Modifications (if applicable) of the contents to be taught
1.- Mixed education: no intention to change the contents
2.- Non-attendance teaching: no intention of changing the content
* Additional bibliography to facilitate self-learning
It's not necessary.
* Other modifications
=== ADAPTATION OF THE EVALUATION ===
* Tests already carried out
Test * XX: [Previous weight 00%] [Proposed weight 00%]
1.- Mixed education: the weights of the face-to-face situation are kept.
2.- Non-contact teaching: the weights of the face-to-face situation are preserved.
* Evidence that changes
[Old test] => [New test]
1.- Mixed education: do not change
2.- Non-attendance teaching: unchanged
During non-contact teaching, students, in these exceptional circumstances, should address this issue with responsible and honest behavior. Any form of copying intended to falsify the level of knowledge and skills attained in the preparation of the deliverables, as well as during the virtual examination, will be considered inadmissible. If there is any suspicion of fraudulent conduct, students may be subject to additional verification to verify its accuracy.