

Sedimentology

Code: 101061
ECTS Credits: 6

Degree	Type	Year	Semester
2500254 Geology	OB	2	2

Contact

Name: Oriol Oms Llobet
Email: joseporiol.oms@uab.cat

Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Oriol Oms Llobet

External teachers

Ramon Mercedes

Prerequisites

Although there is no official prerequisite, it is very important to have followed the Stratigraphy subject (or at least to have a good knowledge of it). This subject is scheduled in the first semester from the second course of the Geology degree.

It is also recommendable for students to have a good understanding of the contents of several subjects from the first course of the Geology degree such as: Fundamentals of Geology (Fundaments de Geologia) and Regional Geology field work (Treball de camp de Geologia Regional).

Objectives and Contextualisation

- a) Acquisition of theoretical and practical concepts on the descriptive and analytical techniques common in sedimentology, which are closely linked to Stratigraphy.
- b) Interpretation of facies and its associations.
- c) Determination of facies sequences
- d) Identification of depositional environments on the basis of facies analysis
- e) Acquisition of field skills on the use of concepts explained in the lessons.

The student has to apply in the field the contents of lectures. Fieldwork is a basic element of the subject to achieve: facies identification from several environments and paleogeographical reconstructions.

Competences

- Learn and apply the knowledge acquired, and use it to solve problems.
- Process, interpret and present field data using qualitative and quantitative techniques, and suitable computer programmes.
- Recognise sedimentary facies and the processes and environments that generate them.
- Use concepts from physics when solving problems in geology.

Learning Outcomes

1. Apply concepts of hydrodynamics, fluid dynamics and rheology to transport and sedimentation processes.
2. Learn and apply the knowledge acquired, and use it to solve problems.
3. Process stratigraphic and sedimentological data from the field in order to produce new synthesis data and documents.
4. Recognise sedimentary facies and the processes and environments that generate them.

Content

PROGRAM OF THEORETICAL LESSONS

- Introduction
- Fluvial facies
- Alluvial facies
- Deltaic facies
- Tidal facies
- Estuary and tidal flat facies
- Beach and barrier island facies
- Deep marine facies
- Eolian facies
- Lacustrine facies
- Carbonate facies
- Other facies

PROGRAMA DE CLASSES PRÀCTIQUES

- Performing and interpretation of stratigraphic sections from several environments.

FIELDWORK EXERCISES

During 2 field days the student will make a set of exercises and once are finished, the teacher will comment them.

The student has to be able of:

- a) Recognition of sedimentary structures and materials which permit facies identification.
- b) Sketching of geological cross sections, stratigraphic logs or schemes.

- c) Identification of distinctive features of several environments
- d) Paleoenvironmental characterization on the basis of these facies.

Methodology

The subject of Sedimentology consists of three types of activities:

1.- Directed Activities

Theoretical lessons

- The contents will be taught mainly by the teacher in the form of master classes. The student acquires the scientific-technical knowledge of the subject attending the lectures and complementing them with the personal study of the explained topics. These sessions can be complemented with questions and simple exercises that are interrelated with the explanations. Part of the material used in class by the teacher will be available on the Virtual Campus of the subject.
- It is recommended that students regularly check books and recommended web links in order to consolidate, clarify and extend the contents explained in class. Laboratory practices Both field and laboratory practices will help facilitate understanding and consolidate the contents of the theory program.
- Students will have downloaded and printed the script of the practice, which they will deliver individually. This practical work involves the prior knowledge of the theory and the application of it in a practical example. Students must complete the document that will be delivered to the lecturer at the end of the session.

Field practices

- These consist of two days.
- In the course of the exit, exercises will be considered constantly to solve the outcrop. Special emphasis will be placed on the student being caring for and taking care of the field notebook, that is, in the compilation of data ordering in the field.

2.- Supervised activities

Some types of supervised activities can be proposed such as:

- a) Preparation of a fieldwork for groups on an outcrop that students will choose

- b) Presentation in class of the works on a given subject. Both the work and the presentation will be done in group
- c) Group and individual mentorings in order to support the training activities indicated above. A mentoring session

3.- Autonomous activities

This section includes the study, the elaboration of the works and the reading of bibliographic references.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Fieldwork	14	0.56	1, 4
Laboratory practices	12	0.48	3, 2
Theoretical lessons	26	1.04	1, 4
Type: Supervised			
Group or individual mentoring	1	0.04	1, 3, 2, 4
Performance of a fieldwork report	9	0.36	1, 3, 2, 4
Performance of a report on a particular issue	5	0.2	1, 4
Type: Autonomous			
Study, report performance	76	3.04	1, 3, 2, 4

Assessment

Any special circumstances (such as pandemics) may slightly affect the way to evaluate the subject.

1.- Theoretical part of the partial tests (80%)

During the semester there will be two (or at most three) compulsory partial tests. Failed partial tests (grade less than 5) may be recovered in a final test or

2.- Practical part of the partial test (15%)

In the partial and final recovery test there will be questions about the course content. Attendance to laboratory practices is mandatory; and at most it will be possible to recover. There will be partial tests on the practices carried out.

3.- Evaluation of field work (5%)

The evaluation of the fieldwork will be based on individual tests on the work and may include: field exercise, assessment of field books and the attitude.

4.- Final recovery test

Fail partial theoretical tests (note less than 5) may be recovered in a final test.

No tests will be made outside the established days

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Course contents in the final/partial tests	80	6	0.24	1, 3, 2, 4
Final recovery test	0	0	0	1, 3, 2, 4
Score on field work practices	5	0.5	0.02	2, 4
Score on the laboratory practices	15	0.5	0.02	3, 2

Bibliography

Basic references

Arche, A. (1989), Sedimentología. Vol. 1 y 2. C.S.I.C. Nuevas Tendencias

Arche, A. (2010). Sedimentología. el proceso físico a la cuenca sedimentaria. Ed. CSIC. ISBN: 978-84-00-09145-3

Bogg, S. (2006).- Principles of Sedimentology and Stratigraphy, 4th ed., Pearson-Prentice Hall

Bridge, J.S. (2004). Rivers and floodplains. Blackwell. 491 pp

Flügel, E. (2004). Microfacies of carbonate rocks. Springer. 916

Davis, R.A. & Dalrymple, R.W. (2011). Principles of tidal sedimentology. Springer. 621 pp.

Galloway, W.E. ; Hobday, D.K. (1983) Terrigenous clastic depositional systems. Springer-Verlag, New York,

James, N.P. & Dalrymple, R.W. (2010). Facies models, 4. Geotext. 6. Geological association of Canada. Galloway, W. E.; Hobday, D. K. : Terrigenous clastic depositional systems, applications to fossil fuel and groundwater resources. 2nd ed. Ed. Springer, 1996

Nichols, G. (2009) Sedimentology & Stratigraphy. Blackwell Science.

Reading, H.G. (Ed.), (1996). Sedimentary Environments: Processes, Facies and Stratigraphy . 3rd. Edition, Blackwell Scientific Publications

Ricci Lucchi, F. (1980) Sedimentologia. 2a ed. Bolonya: CLUEB. Vol. 3.

Tucker, M. (ed.) (1988), Techniques in Sedimentology. Blackwell Scientific Publications.

Vera, J. (1994) Estratigrafia (principios y métodos). Madrid: Rueda.

Links

<http://cit.iec.cat>

<http://www.lib.utexas.edu/>

<http://www.stratigraphy.org/>

<http://strata.geol.sc.edu/exerices/ExercisePrintOuts.html>

http://facstaff.gpc.edu/~pgore/geology/historical_lab/contents.php

<http://www.bib.ub.edu/recursos-informacio/guies-tematiques/geologia/#c4820>

Software

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